

# CITY OF ALBUQUERQUE

Planning Department  
David Campbell, Director



Mayor Timothy M. Keller

November 14, 2018

Glenn Broughton PE  
Bohannon Huston, Inc.  
7500 Jefferson St NE  
Albuquerque, NM 87109

RE: **Oso Bio Syringe Line**  
**4401 Alexander Blvd NE**  
**Grading and Drainage Plan for Building Permit**  
**Engineer's Stamp Date 11/1/2018 Disapproved**  
**Hydrology File: F16D003B1**

Dear Mr. Broughton,

PO Box 1293

Based on the submittal received on 11/5/2018 the above-referenced Grading Plan and Drainage Plan cannot be approved until the following are corrected and a complete resubmittal is made:

Albuquerque

NM 87103

www.cabq.gov

1. In the HEC-HMS Model:
  - a. Per the draft DPM, 6-1(B)(2) *Computation of Time of Computation*, if  $t_c$  is computed to be less than 0.2hrs, than use 0.2hrs. Lag time then becomes  $0.6 * t_c = 7.2$  minutes.
  - b. The inlet elevation for the PVC pipes is specified as 5033' but is 5032' in the plans.
  - c. The outlet elevation for the PVC pipes is specified at 5031.9' but is ~5031' in the plans; also the outlet elevation of the pipes and the Invert-In and Invert-Out of the sidewalk culverts should be specified on the plans.
  - d. The bottom of pond is defined as 5031' in the model, but shown as 5031.5' on the plans.
2. The proposed 100-yr WSEL needs to be shown on the pond in plan view.

Prior to Certificate of Occupancy (For Information):

3. Engineer's Certification, per the DPM Chapter 22.7: *Engineer's Certification Checklist For Non-Subdivision* is required. The Engineer's Certification must be placed on the approved Grading and Drainage Plan after the revised plan gets approved. It should include as-built survey information from a registered professional surveyor and a certification statement from a registered professional engineer.
4. The sidewalk culverts must be inspected and approved by storm drain maintenance (Jason Rodriguez, jtrodriguez@cabq.gov or 857-8607).
5. Bernalillo County Recorded Drainage Covenants (No Public Easement) are required for the stormwater control pond (one for each side of the property line). The original notarized form,

# CITY OF ALBUQUERQUE

*Planning Department*  
David Campbell, Director



*Mayor Timothy M. Keller*

exhibit A (legible on 8.5x11 paper), and recording fee (\$25, payable to Bernalillo County) must be turned into DRC (4th, Plaza del Sol) for routing. Please contact Charlotte LaBadie (clabadie@cabq.gov, 924-3996) or Madeline Carruthers (mtafoya@cabq.gov, 924-3997) regarding the routing and recording process for covenants. The routing and recording process for covenants can take a month or longer; Hydrology recommends beginning this process as soon as possible as to not delay approval for certificate of occupancy.

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

Dana M. Peterson  
Senior Engineer, Planning Dept.  
Development Review Services

PO Box 1293

Albuquerque

NM 87103

[www.cabq.gov](http://www.cabq.gov)



# City of Albuquerque

Planning Department

Development & Building Services Division

## DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 3/2018)

**Project Title:** \_\_\_\_\_ **Building Permit #:** \_\_\_\_\_ **Hydrology File #:** \_\_\_\_\_

**DRB#:** \_\_\_\_\_ **EPC#:** \_\_\_\_\_ **Work Order#:** \_\_\_\_\_

**Legal Description:** \_\_\_\_\_

**City Address:** \_\_\_\_\_

**Applicant:** \_\_\_\_\_ **Contact:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Phone#:** \_\_\_\_\_ **Fax#:** \_\_\_\_\_ **E-mail:** \_\_\_\_\_

**Other Contact:** \_\_\_\_\_ **Contact:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Phone#:** \_\_\_\_\_ **Fax#:** \_\_\_\_\_ **E-mail:** \_\_\_\_\_

Check all that Apply:

IS THIS A RESUBMITTAL?:  Yes  No

**DEPARTMENT:**

- HYDROLOGY/ DRAINAGE
- TRAFFIC/ TRANSPORTATION

**TYPE OF APPROVAL/ACCEPTANCE SOUGHT:**

- BUILDING PERMIT APPROVAL
- CERTIFICATE OF OCCUPANCY
- PRELIMINARY PLAT APPROVAL
- SITE PLAN FOR SUB'D APPROVAL
- SITE PLAN FOR BLDG. PERMIT APPROVAL
- FINAL PLAT APPROVAL
- SIA/ RELEASE OF FINANCIAL GUARANTEE
- FOUNDATION PERMIT APPROVAL
- GRADING PERMIT APPROVAL
- SO-19 APPROVAL
- PAVING PERMIT APPROVAL
- GRADING/ PAD CERTIFICATION
- WORK ORDER APPROVAL
- CLOMR/LOMR
- FLOODPLAIN DEVELOPMENT PERMIT
- OTHER (SPECIFY) \_\_\_\_\_

**TYPE OF SUBMITTAL:**

- ENGINEER/ARCHITECT CERTIFICATION
- PAD CERTIFICATION
- CONCEPTUAL G & D PLAN
- GRADING PLAN
- DRAINAGE MASTER PLAN
- DRAINAGE REPORT
- FLOODPLAIN DEVELOPMENT PERMIT APPLIC
- ELEVATION CERTIFICATE
- CLOMR/LOMR
- TRAFFIC CIRCULATION LAYOUT (TCL)
- TRAFFIC IMPACT STUDY (TIS)
- OTHER (SPECIFY) \_\_\_\_\_
- PRE-DESIGN MEETING?

**DATE SUBMITTED:** \_\_\_\_\_ **By:** \_\_\_\_\_

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: \_\_\_\_\_

FEE PAID: \_\_\_\_\_

November 2, 2018

Dana M. Peterson, PE  
Senior Engineer, Planning Department  
City of Albuquerque  
600 2nd Street NW  
Albuquerque, NM 87102

Re: Oso Bio Syringe Line Grading Plan Submittal; Hydrology File F16D003B1

Dear Mr. Peterson:

Enclosed for your review is a copy of the Oso Bio Syringe Line Drainage Management Plan and Grading Plan Resubmittal. Below is a brief description of how the comments from your letter dated October 23, 2018 were addressed:

1. A digital submittal include HEC-HMS models have been provided with this submittal.
2. SO-19 notes have been deleted from sheet C1.0 and added to sheets C1.1, C1.3 and C1.4. The standard drawing for sidewalk culverts have been added to the keyed notes.
3. The sidewalk culvert has been added at the Montbel PI. rundown. The calculations were based on a 1.5% slope. The slope shown on the table was rounded to the nearest hundredth. This has been revised.
4. Spot elevations from the survey have been added to the top of berm and spillway. The is shown on sheet C1.4. Transportation has agreed to allow the two northern driveways on the site to remain open if the owner will remove the concrete barriers. The owner has agreed to this. Spillway calculations are shown on the proposed DMP.
5. The MWSE has been added to the sections on both the plans and DMP. Keyed note 3 on sheet C1.4 notes to remove vegetation from the pond and embankment.
6. The details have been modified to more clearly depict the trash screen detail.

Engineering ▲

Spatial Data ▲

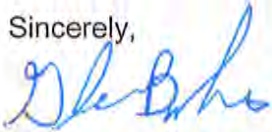
Advanced Technologies ▲

Dana M. Peterson, PE  
City of Albuquerque  
November 2, 2018  
Page 2

7. The drainage covenant exhibit has been modified and approved. There was an error in the pond volume calculations previously submitted. It has been corrected and the HEC-HMS model updated. The volume has been updated on the attached drainage covenant exhibit. We are in the process of getting the owners signature on the document. The original and filing fee will be submitted to the City once we receive it.

With this submittal, we are requesting City of Albuquerque Hydrology Building Permit Approval. If you have any questions or require further information, please feel free to contact me.

Sincerely,

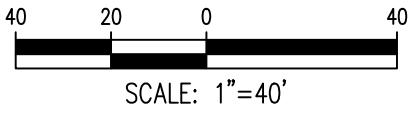
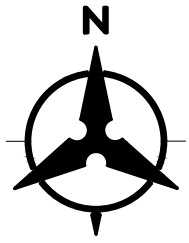


Glenn S. Broughton, PE  
Senior Project Manager  
Community Development & Planning

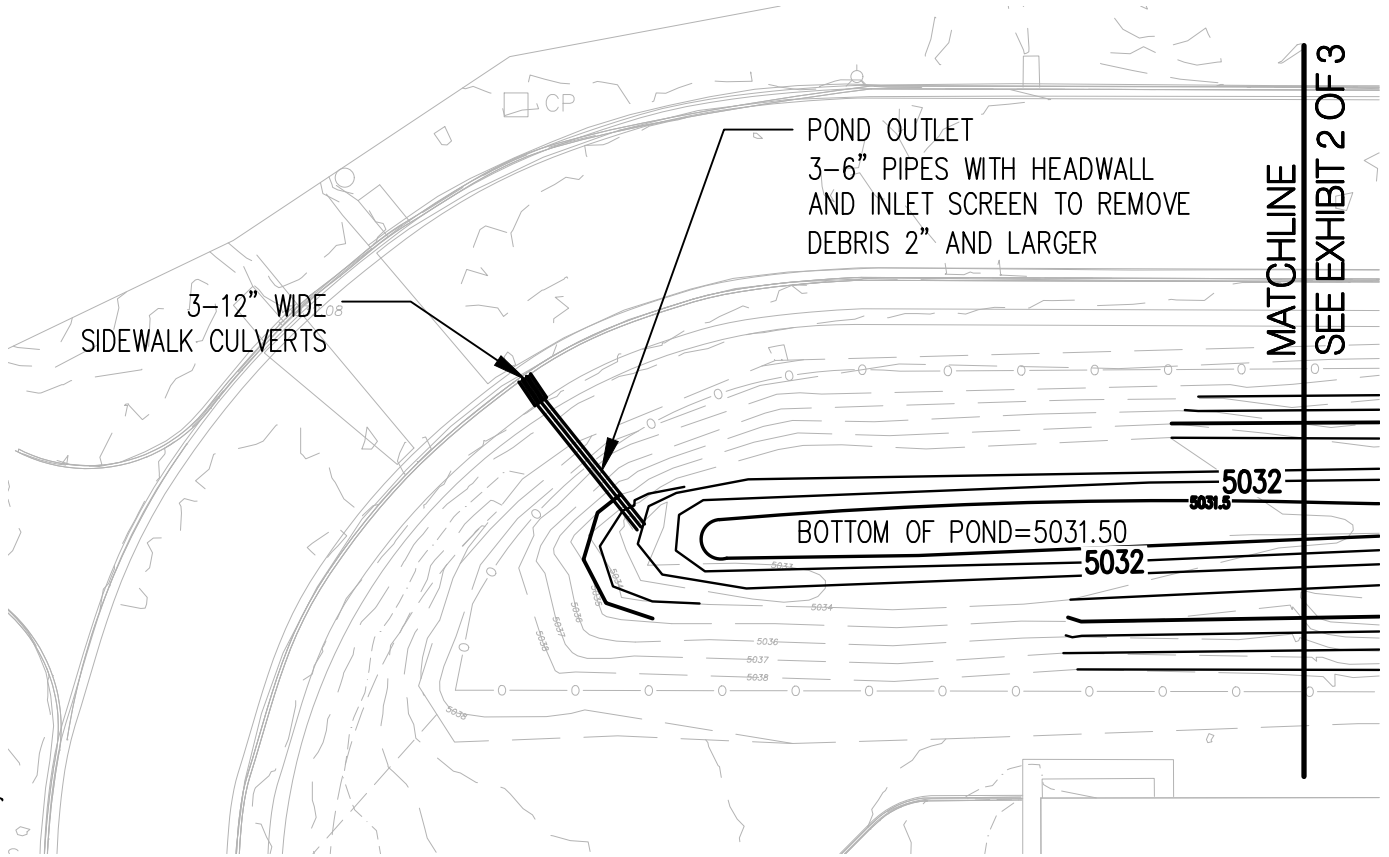
GSB/mr  
Enclosures

TRACT A & B BLOCK 5  
 REPLAT OF TRACT  
 2-A SUNDTS  
 INDUSTRIAL CENTER  
 PRIVATE POND EXHIBIT

SHEET 1 of 3

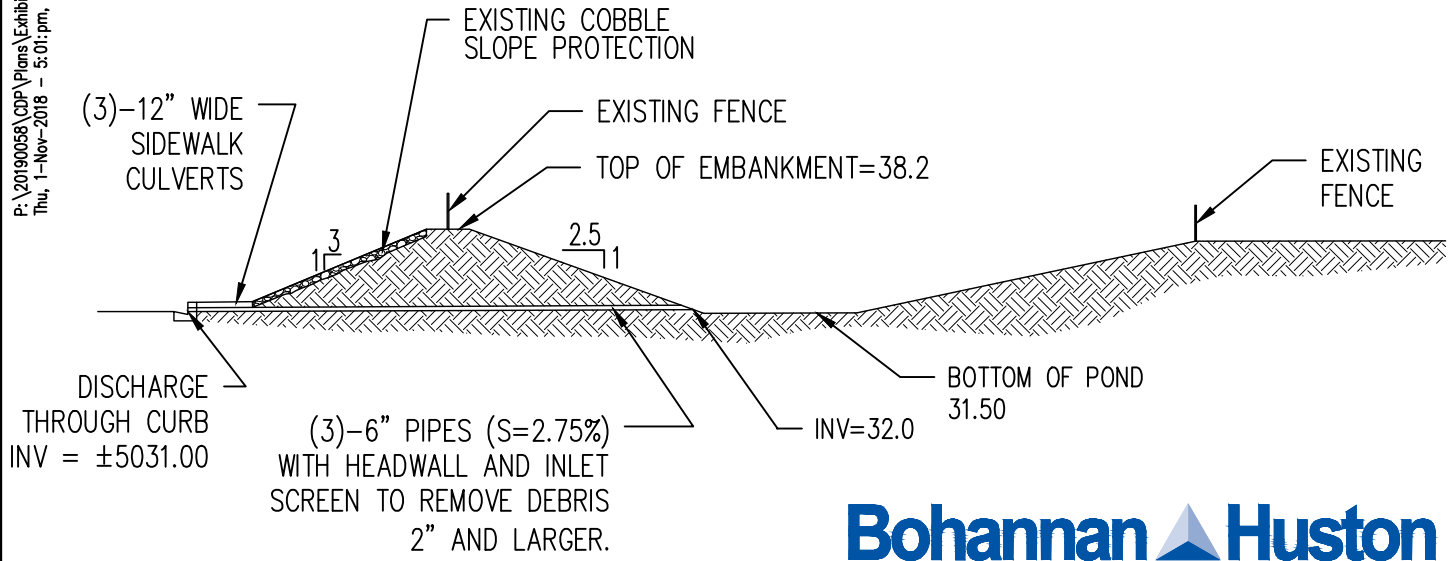


POND VOLUME= 106359 CF (2.44 AC. FT)



MATCHLINE  
SEE EXHIBIT 2 OF 3

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Thu, 1-Nov-2018 - 5:01:pm, Plotted by J.LUTZ

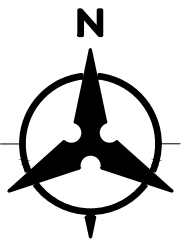
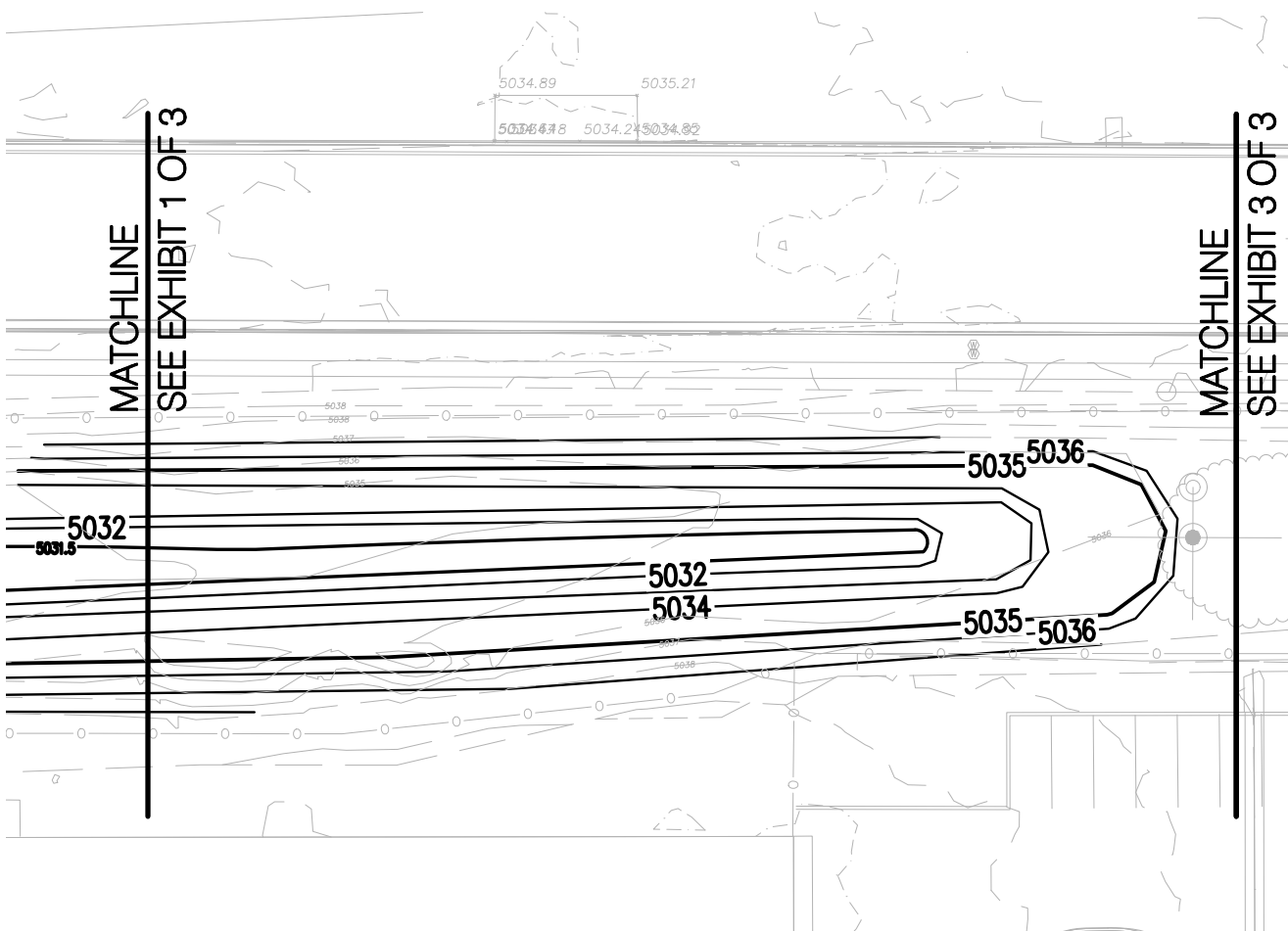




TRACT A & B BLOCK 5  
REPLAT OF TRACT  
2-A SUNDTS  
INDUSTRIAL CENTER  
PRIVATE POND EXHIBIT

SHEET 2 of 3

POND VOLUME= 106359 CF (2.44 AC. FT)



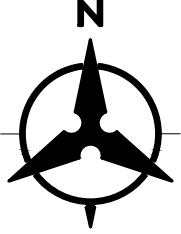
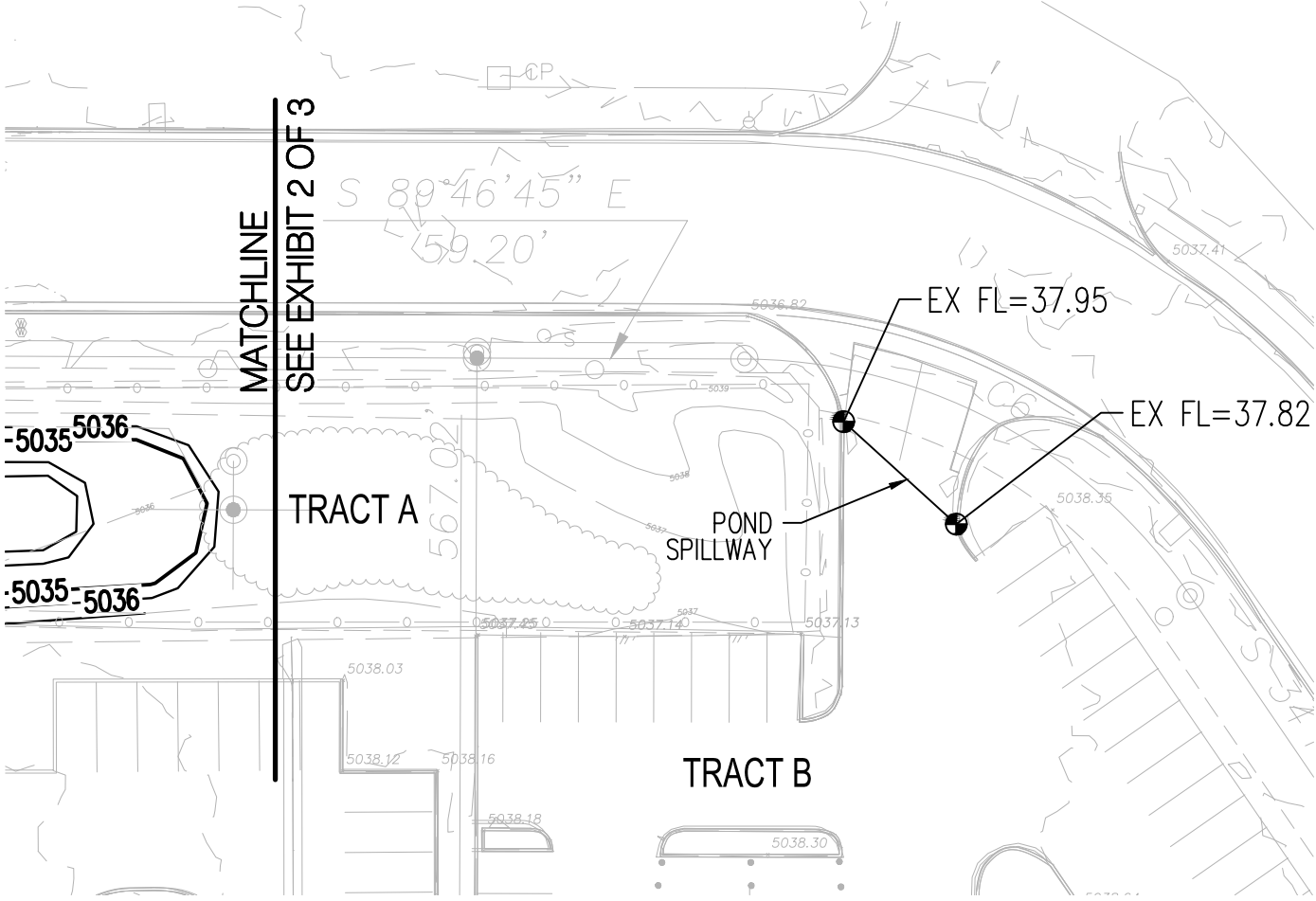
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TRACT A & B BLOCK 5  
REPLAT OF TRACT  
2-A SUNDTS  
INDUSTRIAL CENTER  
PRIVATE POND EXHIBIT

SHEET 3 of 3

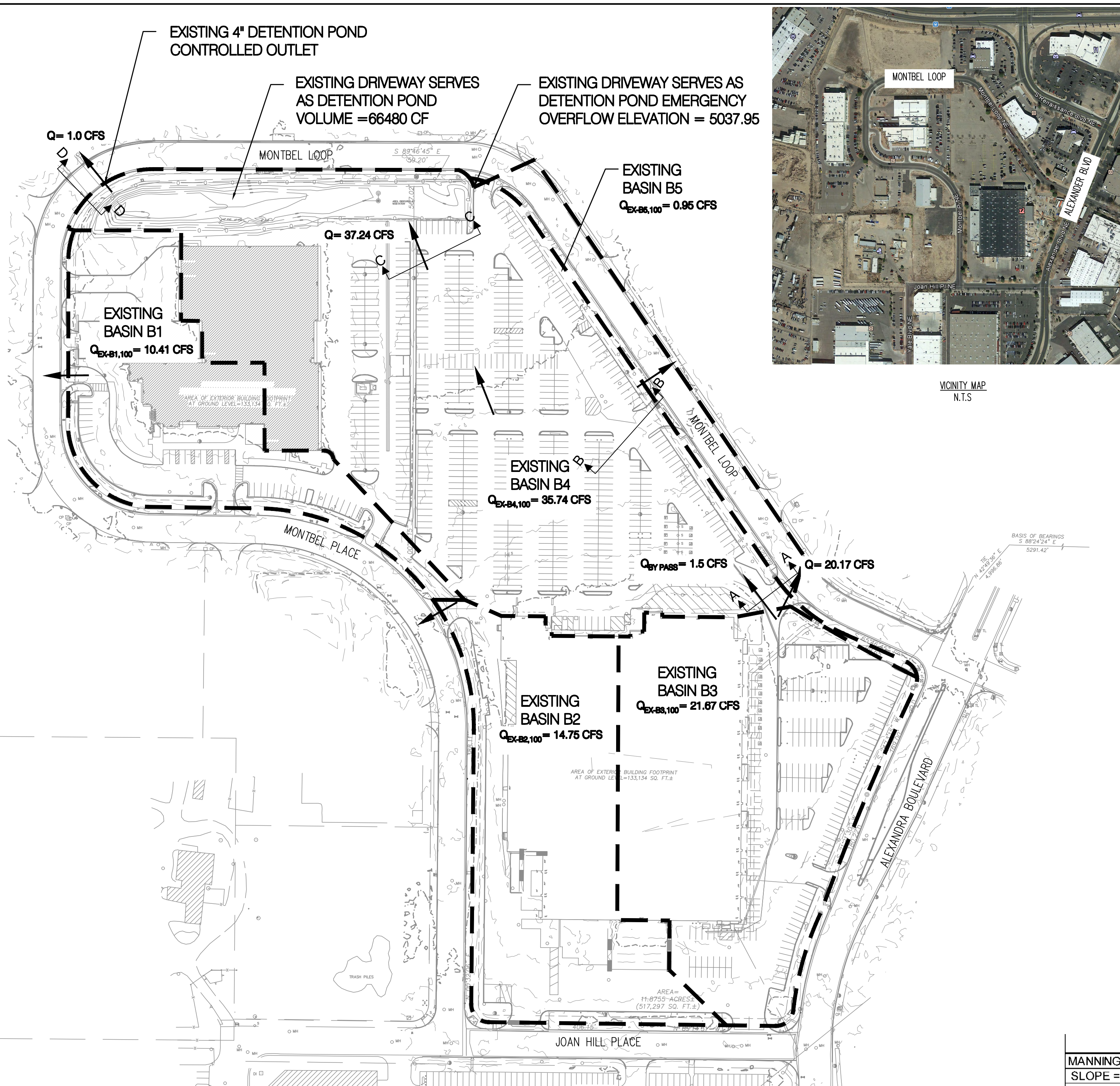
POND VOLUME= 106359 CF (2.44 AC. FT)



SCALE: 1"=40'

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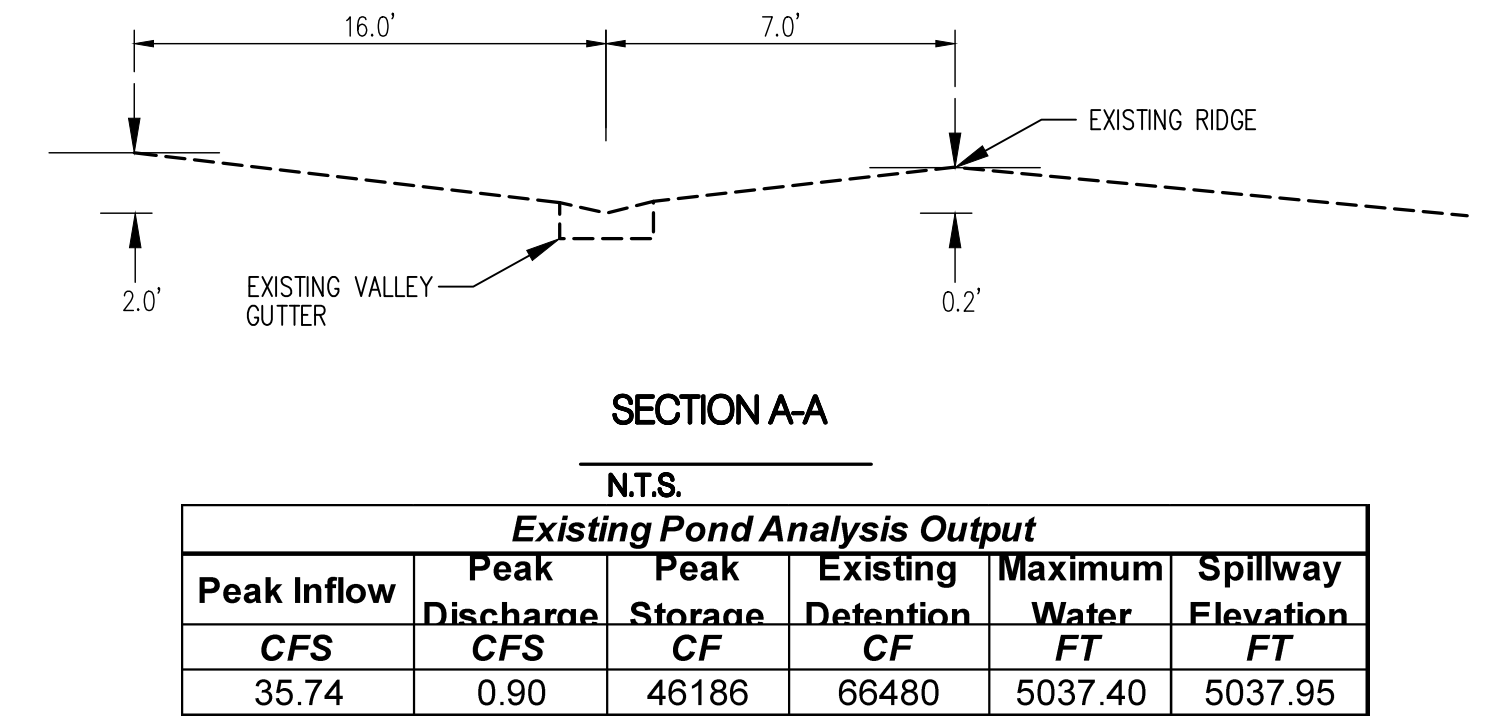


Basin	Area	Area	SCS Curve Number	Q100 (cfs)	Q/Acre (cfs/acre)	Volume (ac-ft)
	(sq ft)	(sq mi)				
EX-B1	103121	0.00370	94	10.41	4.40	0.39
EX-B2	132690	0.00477	97	14.75	4.84	0.59
EX-B3	195110	0.00700	97	21.67	4.84	0.86
EX-B4	331107	0.01188	96	35.74	4.70	1.4
EX-B5	11923	0.00042	89	0.95	3.47	0.03

**Paved Swale/ Valley Gutter Capacity Calculation**

MANNING'S N = 0.016  
SLOPE = 0.010

POINT	DIST	ELEV	WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ.FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID WATER (FT)	TOTAL ENERGY (FT)	FROUDE NO.
1	-16	2	0.01	0.01	0.002	0.001	0.431	0.271	0.43	0.011	0.676
2	0	0	0.02	0.02	0.009	0.004	0.862	0.431	0.86	0.023	0.759
3	7	0.2	0.03	0.03	0.019	0.011	1.292	0.564	1.29	0.035	0.812
			0.04	0.04	0.034	0.024	1.723	0.683	1.72	0.047	0.852
			0.05	0.05	0.054	0.043	2.154	0.793	2.15	0.06	0.884
			0.06	0.06	0.077	0.069	2.585	0.896	2.58	0.072	0.912
			0.07	0.07	0.105	0.105	3.015	0.993	3.01	0.085	0.935
			0.08	0.08	0.138	0.149	3.446	1.085	3.44	0.098	0.956
			0.09	0.09	0.174	0.204	3.877	1.174	3.87	0.111	0.975
			0.1	0.1	0.215	0.271	4.308	1.259	4.3	0.125	0.993
			0.11	0.11	0.26	0.349	4.738	1.342	4.73	0.138	1.009
			0.12	0.12	0.31	0.44	5.169	1.422	5.16	0.151	1.023
			0.13	0.13	0.363	0.545	5.6	1.5	5.59	0.165	1.037
			0.14	0.14	0.421	0.664	6.031	1.576	6.02	0.179	1.05
			0.15	0.15	0.484	0.798	6.461	1.65	6.45	0.192	1.062
			0.16	0.16	0.55	0.948	6.892	1.722	6.88	0.206	1.074
			0.17	0.17	0.621	1.114	7.323	1.793	7.31	0.22	1.084
			0.18	0.18	0.697	1.298	7.754	1.863	7.74	0.234	1.095
			0.19	0.19	0.776	1.499	8.185	1.931	8.17	0.248	1.105



**INTRODUCTION:**

THE PURPOSE OF THIS SUBMITTAL IS TO PRESENT THE EXISTING DRAINAGE MANAGEMENT PLAN FOR THE OSO BIO AND THE ALBUQUERQUE AMBULANCE SITES. THIS ANALYSIS WILL QUANTIFY DISCHARGE RATES, ASSOCIATED VOLUMES AND CAPACITY OF THE DETENTION POND.

THE SITE IS LOCATED AT THE NORTHWEST CORNER OF JOAN HILL PLACE AND ALEXANDRA BOULEVARD. IT IS BORDERED ON THE NORTH BY MONTBEL LOOP, ON THE WEST BY MONTBEL PLACE, ON THE SOUTH BY JOAN HILL PLACE AND ON THE EAST BY ALEXANDRA BOULEVARD. THE TOTAL ANALYSIS AREA IS APPROXIMATELY 18 ACRES AND ALL OF WHICH IS FULLY DEVELOPED.

**METHODOLOGY:**

THE CITY IS IN THE PROCESS OF UPDATING THE DPM. ALTHOUGH THE DPM UPDATE HAS NOT BEEN OFFICIALLY ADOPTED, THE ANALYSIS METHODOLOGY IS PER THE PROPOSED UPDATE.

THE METHODOLOGY SELECTED TO COMPUTE RUNOFF VOLUME IS BASED ON THE SCS UNIT HYDROGRAPH. RAINFALL VALUES WERE BASED ON THE PROPOSED VALUES FROM THE DPM. THE SITE WAS ANALYZED FOR THE 100 YEAR 24 HOUR STORM EVENT USING THE US ARMY CORPS OF ENGINEERS HYDROLOGIC ENGINEERING CENTER'S HYDROLOGIC MODELING SYSTEM (HEC-HMS, VERSION 4.2). SURFACE CHARACTERISTICS AFFECTING INITIAL ABSTRACTION AND INFILTRATION RATES ARE PRESENTED BY CURVE NUMBERS. CURVE NUMBERS ARE BASED ON LAND TREATMENT AND AS SPECIFIED IN THE DPM UPDATE.

**EXISTING CONDITIONS:**

A DRAINAGE REPORT FOR PRICE CLUB SITE IMPROVEMENTS DATED SEPTEMBER 1990 IS THE BASIS OF THE ALLOWABLE PEAK DISCHARGE FROM THE SITE. BASED ON THIS REPORT THE ALLOWABLE DISCHARGE FROM THE SITE IS 32.35 CFS.

BASED ON THE EXISTING TOPOGRAPHY, THE ENTIRE SITE IS DIVIDED INTO 5 BASINS.

EXISTING BASIN 1 IS APPROXIMATELY 2.37 ACRES AND CONSISTS PAVED AREA, ROOF AREA AND SOME LANDSCAPED AREA. DRAINAGE OF THIS BASIN DISCHARGES TO MONTBEL LOOP.

EXISTING BASIN 2 IS LOCATED NORTH OF JOAN HILL PLACE. THIS BASIN IS APPROXIMATELY 3.05 ACRES AND CONSISTS LARGE AMOUNT OF ROOF AREA, PAVED AREA AND VERY LIMITED AMOUNT OF LANDSCAPED AREA. DRAINAGE OF THIS BASIN DISCHARGES TO MONTBEL PLACE.

EXISTING BASIN 3 IS APPROXIMATELY 4.48 ACRES. IT IS LOCATED WEST OF ALEXANDRA BOULEVARD. ACCORDING TO THE DRAINAGE REPORT FOR PRICE CLUB SITE IMPROVEMENTS, SEPTEMBER 1990, THIS BASIN WAS ORIGINALLY DESIGNED TO FLOW TOWARD THE POND. HOWEVER, THE EXISTING PAVED SWALE AND VALLEY GUTTER IS UNDERSIZED TO CONVEY THE CALCULATED PEAK FLOW FOR THIS BASIN TO BASIN A. IT IS DIRECTING MAJORITY OF THE FLOW INTO MONTBEL LOOP. ONLY 1.5 CFS OF THE DISCHARGE FLOWS INTO EXISTING BASIN 4. SEE THE TABLE BELOW FOR THE CAPACITY OF PAVED SWALE/ VALLEY GUTTER.

EXISTING BASIN 4 IS APPROXIMATELY 7.60 ACRES AND COMPOSED OF ROOF, PAVEMENT AND LANDSCAPED POND. RUNOFF OF THIS BASIN FLOWS NORTHWEST AND TOTALLY CONTAINED BY THE POND AND DISCHARGED AT A CONTROLLED RATE.

EXISTING BASIN 5 IS APPROXIMATELY 0.27 ACRES. IT CONSISTS LANDSCAPE AREA AND VERY LIMITED CONCRETE. THIS BASIN DOES NOT CONTRIBUTE ANY SIGNIFICANT AMOUNT OF RUNOFF.

THE DETENTION POND IS LOCATED AT THE NORTH WEST CORNER OF THE SITE. THE POND DISCHARGES TO THE FLOWLINE OF THE GUTTER THROUGH A 4 INCH PVE PIPE. ACCORDING TO THE ORIGINAL DESIGN, THE VOLUME OF THE DETENTION POND WAS 66,717 OF WITH A PEAK DISCHARGE OF 1.03 CFS. BASED ON THIS ANALYSIS THE TOTAL PEAK FLOW DISCHARGING FROM THE SITE IS 46.28 CFS. THE CALCULATED PEAK DISCHARGE FROM THE SITE CURRENTLY EXCEEDS THE ALLOWABLE PEAK DISCHARGE AND IS NOT IN COMPLIANCE WITH THE APPROVED PRICE CLUB DRAINAGE REPORT.

**POND - ORIFICE ANALYSIS**

Orifice Coef	0.62		
Orifice Diam (inches)	4		
Outflow (cfs)	*Head (ft)	Water Surface Elevation	Storage (ac-ft)
0.0	0.00	5033.00	0.00
0.0	0.00	5033.17	0.00
0.3	0.50	5033.50	0.00
0.4	1.00	5034.00	0.02
0.5	1.50	5034.50	0.07
0.6	2.00	5035.00	0.16
0.7	2.50	5035.50	0.28
0.8	3.00	5036.00	0.40
0.8	3.50	5036.50	0.58
0.9	4.00	5037.00	0.77
0.9	4.50	5037.50	1.06
1.0	5.00	5038.00	1.53

\* HEAD MEASURED FROM CENTER OF PIPE  
\* OUTFLOW IS BASED ON 1-4" PIPE

**SECTION B-B Capacity Calculation**

MANNING'S N = 0.016  
SLOPE = 0.014

POINT	DIST	ELEV	POINT	DIST	ELEV
1	40.8	42.287	9	86.26	41.746
2	40.94	42.275	10	88.55	41.779
3	46.88	42.255	11	92.08	41.802
4	47.24	42.271	12	97.2	41.776
5	47.96	42.283	13	100.66	41.773
6	61.76	41.931	14	103.54	41.813
7	83.66	41.789	15	106.63	41.837
8	84.61	41.782	16	133.2	42.138

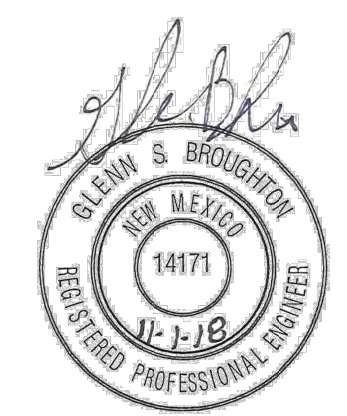
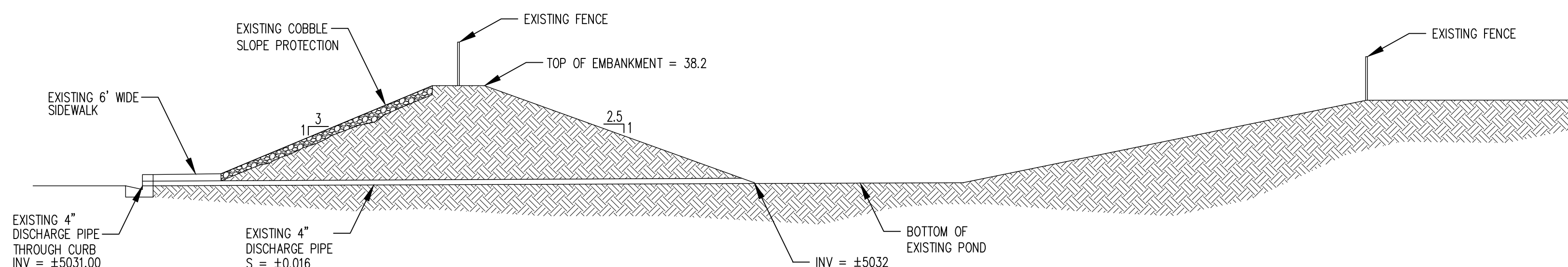
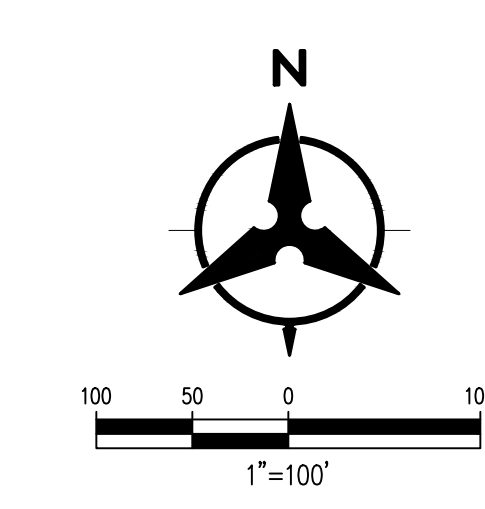
WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ.FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOTAL ENERGY (FT)
41.986	0.24	8.351	24.597	60.182	2.945	0.375
41.996	0.25	8.959	27.271	61.457	3.044	0.394
42.006	0.26	9.58	30.078	62.732	3.14	0.413
42.016	0.27	10.214	33.021	64.007	3.233	0.433
42.026	0.28	10.86	36.099	65.282	3.324	0.452
42.036	0.29	11.519	39.314	66.557	3.413	0.471
42.046	0.3	12.191	42.666	67.832	3.5	0.491
42.056	0.31	12.876	46.158	69.107	3.585	0.51
42.066	0.32	13.573	49.789	70.382	3.668	0.529
42.076	0.33	14.283	53.561	71.657	3.75	0.549
42.086	0.34	15.006	57.474	72.932	3.83	0.568
42.096	0.35	15.742	61.532	74.207	3.909	0.588
42.106	0.36	16.49	65.733	75.481	3.986	0.607
42.116	0.37	17.251	70.08	76.756	4.062	0.627
42.126	0.38	18.025	74.574	78.031	4.137	0.646
42.136	0.39	18.812	79.216	79.306	4.211	0.666

**SECTION C-C Capacity Calculation**

MANNING'S N = 0.016  
SLOPE = 0.012

POINT	DIST	ELEV	POINT	DIST	ELEV
1	139.85	5037.754	8	187.34	5037.422
2	157.44	5037.592	9	191.44	5037.404
3	158.49	5037.589	10	211.99	5037.302
4	163.87	5037.579	11	222.21	5037.296
5	165.51	5037.557	12	228.12	5037.326
6	168.64	5037.519	13	233.4	5037.466
7	184.49	5037.447	14	264.232	5037.8

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ.FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOTAL ENERGY (FT)
5037.396	0.1	8.995	17.754	105.26	1.974	0.161
5037.496	0.2	8.908	18.704	95.019	2.1	0.269
5037.596	0.3	14.85	45.996	88.398	3.097	0.449
5037.696	0.4	24.694	93.657	108.489	3.793	0.624

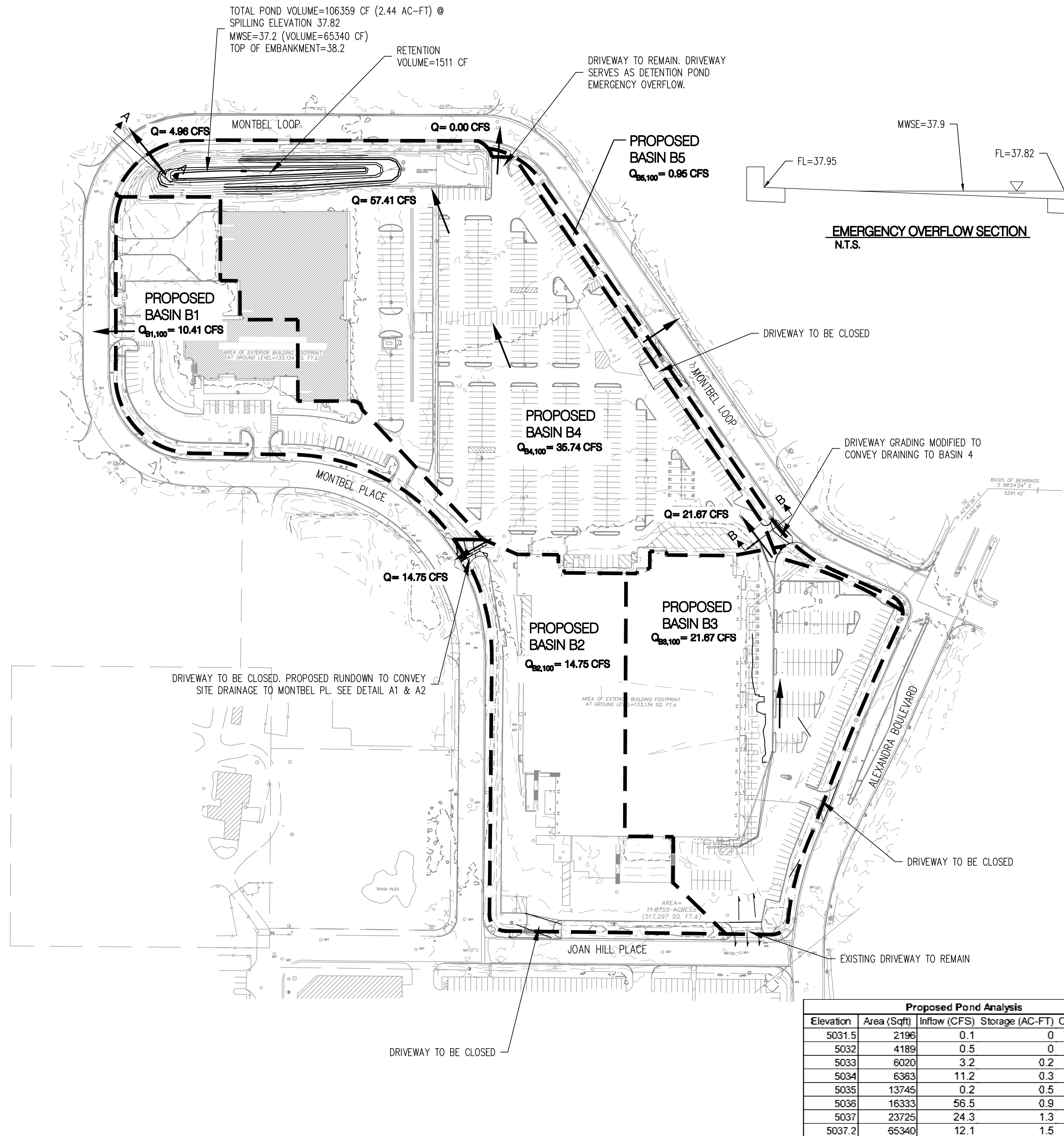


**OSO BIO  
SYRINGE LINE**

**EXISTING DRAINAGE MANAGEMENT PLAN**

DRAWN BY:	DATE: 06/21/2018
CHECKED BY:	PROJECT NO. 20190058
	SHEET NO. 1 OF 2





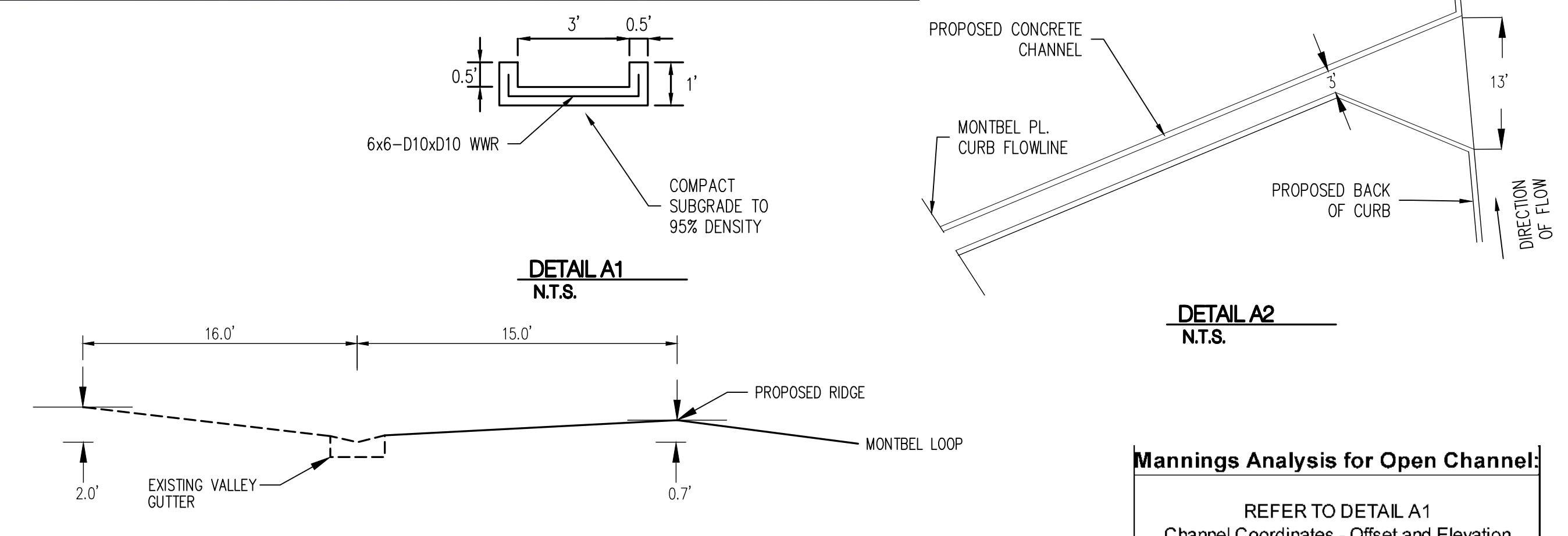
Basin	Area (sq ft)	Area (sq mi)	SCS Curve Number	Q100 (cfs)	Q/Acre (cfs/acre)	Volume (ac-ft)
B1	103121	0.00370	94	10.41	4.40	0.39
B2	132690	0.00477	97	14.75	4.84	0.59
B3	195110	0.00700	97	21.67	4.84	0.86
B4	331107	0.01188	96	35.74	4.70	1.4
B5	11923	0.00042	89	0.95	3.47	0.03

**Proposed Paved Swale/ Valley Gutter Capacity Calculation (SECTION B-B)**

MANNING'S N = 0.016  
 SLOPE = 0.010

POINT	DIST	ELEV
1	-16	2
2	0	0
3	15	0.6

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ.FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS STRUCT (FT)	TOPWID WATER (FT)	TOTAL ENERGY (FT)	FROUDE NO.
0.05	0.05	0.041	0.033	1.654	0.793	0.43	1.65	0.06	0.884
0.1	0.1	0.165	0.208	3.308	1.258	0.86	3.3	0.125	0.992
0.15	0.15	0.371	0.612	4.962	1.649	1.29	4.95	0.192	1.062
0.2	0.2	0.66	1.318	6.616	1.998	1.72	6.6	0.262	1.114
0.25	0.25	1.031	2.39	8.271	2.318	2.15	8.25	0.334	1.156
0.3	0.3	1.485	3.887	9.925	2.618	2.58	9.9	0.407	1.192
0.35	0.35	2.021	5.863	11.579	2.901	3.01	11.55	0.481	1.223
0.4	0.4	2.64	8.371	13.233	3.171	3.44	13.2	0.556	1.25
0.45	0.45	3.341	11.461	14.887	3.43	3.87	14.85	0.633	1.275
0.5	0.5	4.125	15.178	16.541	3.68	4.3	16.5	0.711	1.297
0.55	0.55	4.991	19.571	18.195	3.921	4.73	18.15	0.789	1.318
0.6	0.6	5.94	24.682	19.849	4.155	5.16	19.8	0.869	1.337



**Proposed Pond Analysis Output**

Peak Inflow	Peak Discharge	Peak Storage	Proposed Detention Pond Volume	Maximum Water Surface Elevation	Spillway Elevation
CFS	CFS	CF	CF	FT	FT
57.41	4.80	65340	106286	5037.20	5037.82

**CONCRETE CHANNEL WEIR CALCULATION**

BOTTOM LENGTH = 13  
 DEPTH = 0.50  
 CREST = SHARP  
 TYPE = RECTANGULAR

DEPTH	Q (CFS)	AREA (sqft)	V (fts)	Energy (ft)
0.1	1.37	1.3	1.06	0.12
0.2	3.872	2.6	1.49	0.23
0.3	7.11	3.9	1.82	0.35
0.4	10.95	5.2	2.11	0.47
0.5	15.31	6.5	2.3	0.59

**Mannings Analysis for Open Channel:**

REFER TO DETAIL A1  
 Channel Coordinates - Offset and Elevation

Point #	Offset	Elevation
1	0	0.67
2	0	0
3	3	0
4	3	0.67
A	2.01	sq. ft
W/P	4.34	ft.
R	0.46	ft.
Slope	0.015	%
n	0.013	
Q(max)	16.9	cfs
Q(actual)	14.75	cfs
V(max)	8.4	ft/s

**Proposed Pond Analysis**

Elevation	Area (Sqft)	Inflow (CFS)	Storage (AC-FT)	Outflow (CFS)
5031.5	2196	0.1	0	0
5032	4189	0.5	0	0
5033	6020	3.2	0.2	0
5034	6363	11.2	0.3	2.5
5035	13745	0.2	0.5	3.6
5036	16333	56.5	0.9	4.2
5037	23725	24.3	1.3	4.7
5037.2	65340	12.1	1.5	4.8

**Oso Bio**

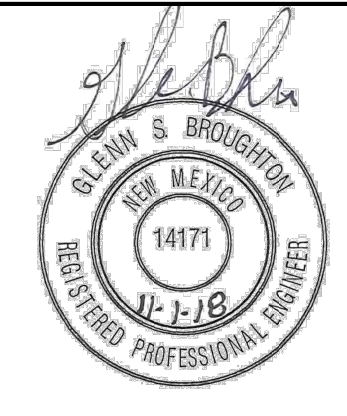
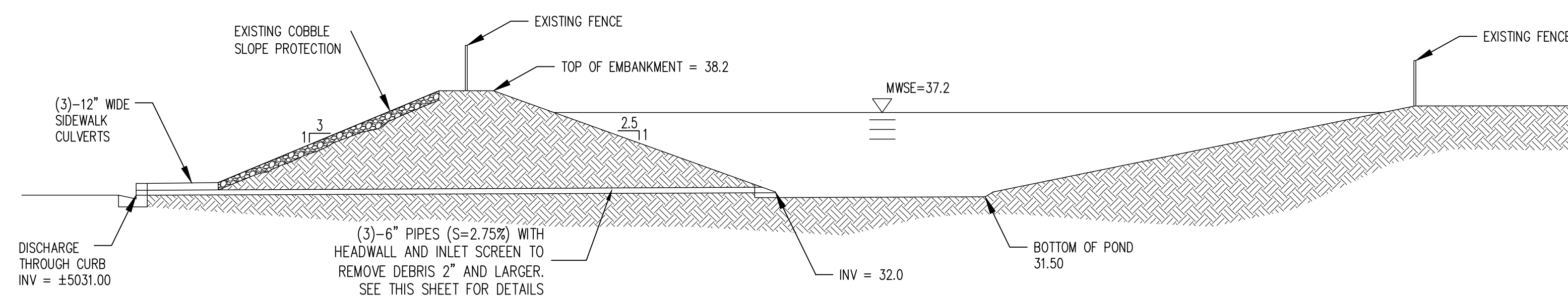
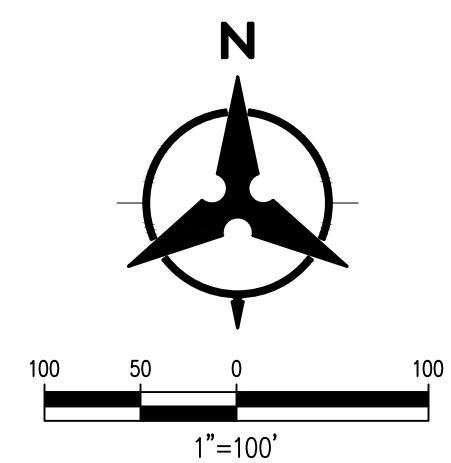
**Proposed Conditions Basin Data Table**

This table is based on the DPM Section 22.2, Zone: 2

Basin ID	Area (SQ. FT)	Area (AC.)	Land Treatment Percentages				Impervious Area (SF)	Precipitation Depth (IN)	Required Volume (CF)	Volume Provided (CF)
			A	B	C	D				
Existing										
B1	103121	2.37	0.0%	0.0%	37.6%	62.5%	0	0.34	0	0
B2	132690	3.05	0.0%	0.0%	8.2%	91.8%	2127	0.34	60	0
B3	195110	4.48	0.0%	0.0%	8.7%	91.3%	15489	0.34	439	0
B4	331107	7.60	0.0%	0.0%	17.5%	82.5%	2881	0.34	82	1511
B5	11923	0.27	0.0%	0.0%	74.1%	25.9%	1354	0.34	38	0
<b>TOTAL</b>	<b>773952</b>	<b>17.77</b>							<b>619</b>	<b>1511</b>

**"FIRST FLUSH" CALCULATIONS**

Basin ID	Area (SQ. FT)	Area (AC.)	Land Treatment Percentages	Impervious Area (SF)	Precipitation Depth (IN)	Required Volume (CF)	Volume Provided (CF)
B1	103121	2.37	0.0%	0.0%	37.6%	62.5%	0
B2	132690	3.05	0.0%	0.0%	8.2%	91.8%	2127
B3	195110	4.48	0.0%	0.0%	8.7%	91.3%	15489
B4	331107	7.60	0.0%	0.0%	17.5%	82.5%	2881
B5	11923	0.27	0.0%	0.0%	74.1%	25.9%	1354
<b>TOTAL</b>	<b>773952</b>	<b>17.77</b>					<b>619</b>



**OSO BIO SYRINGE LINE**

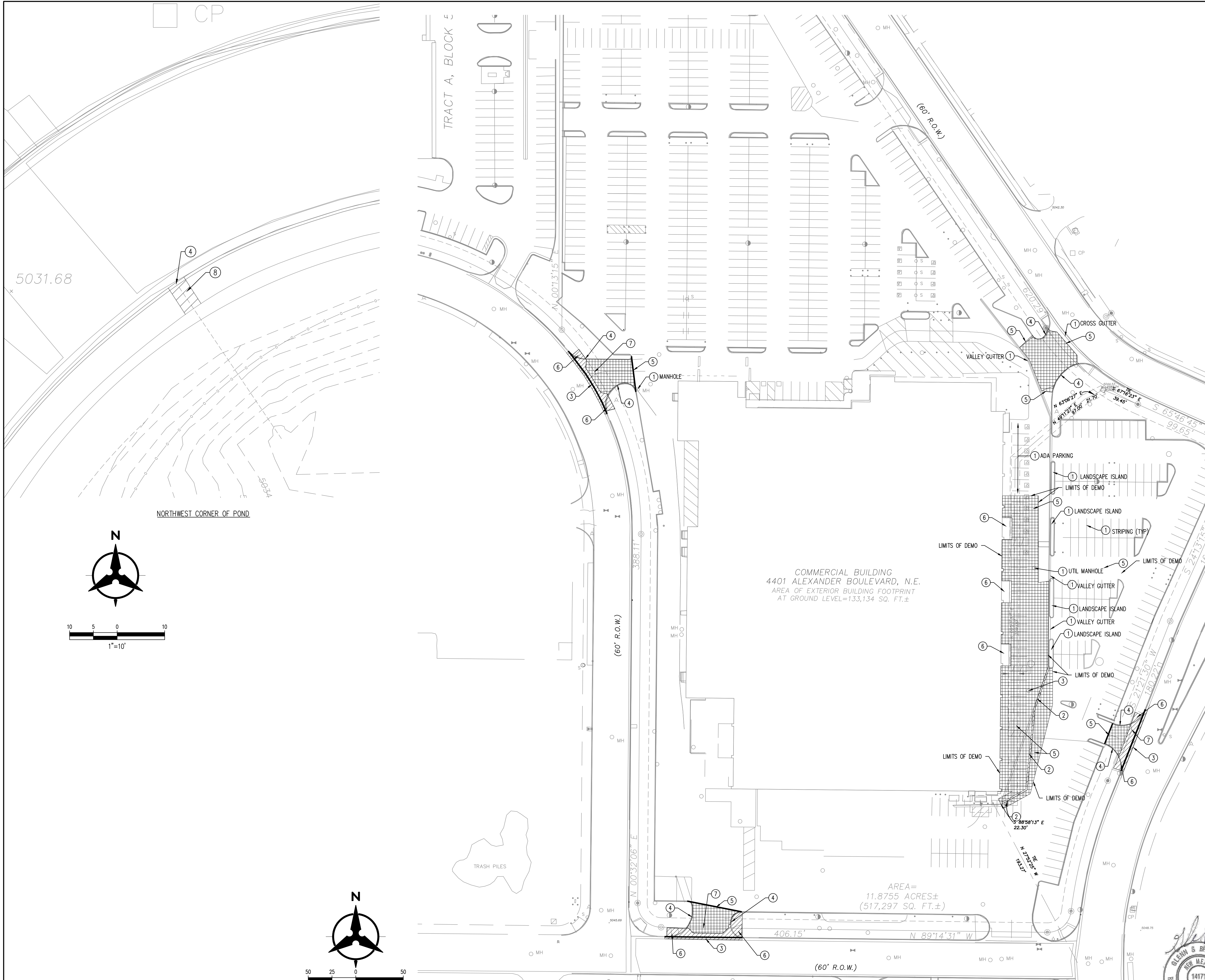
**PROPOSED DRAINAGE MANAGEMENT PLAN**

DRAWN BY: \_\_\_\_\_ DATE: 10/10/2018

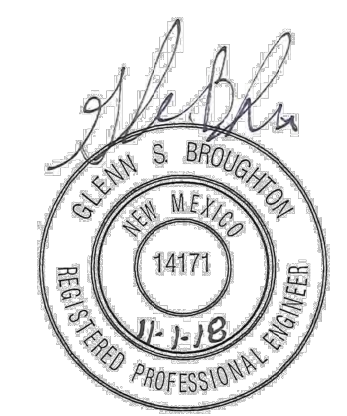
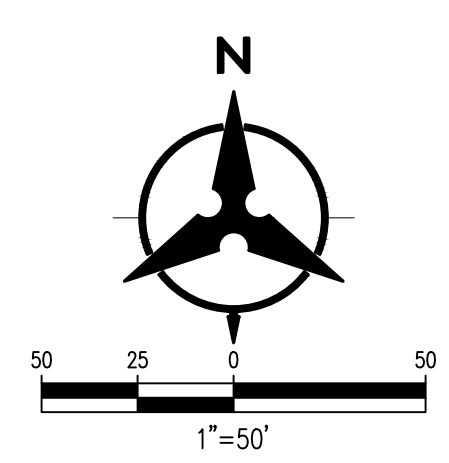
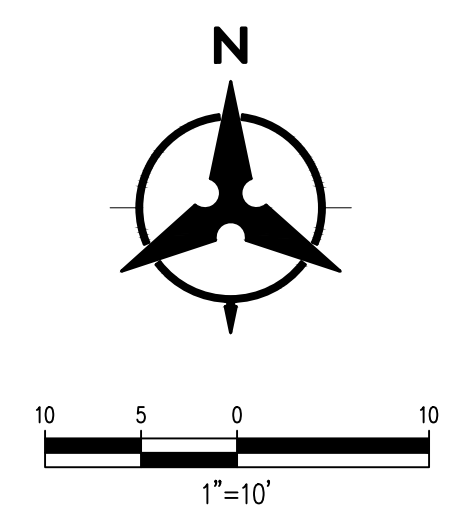
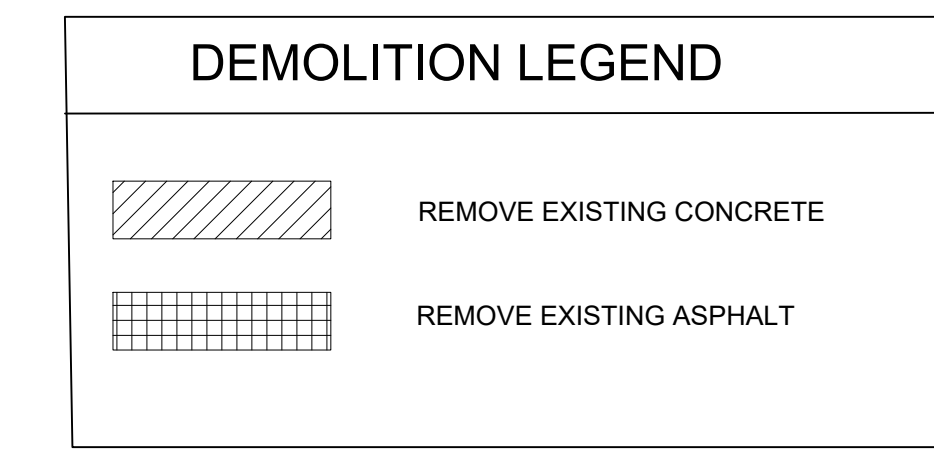
CHECKED BY: \_\_\_\_\_ PROJECT NO: 20190058 SHEET NO: 2 OF 2



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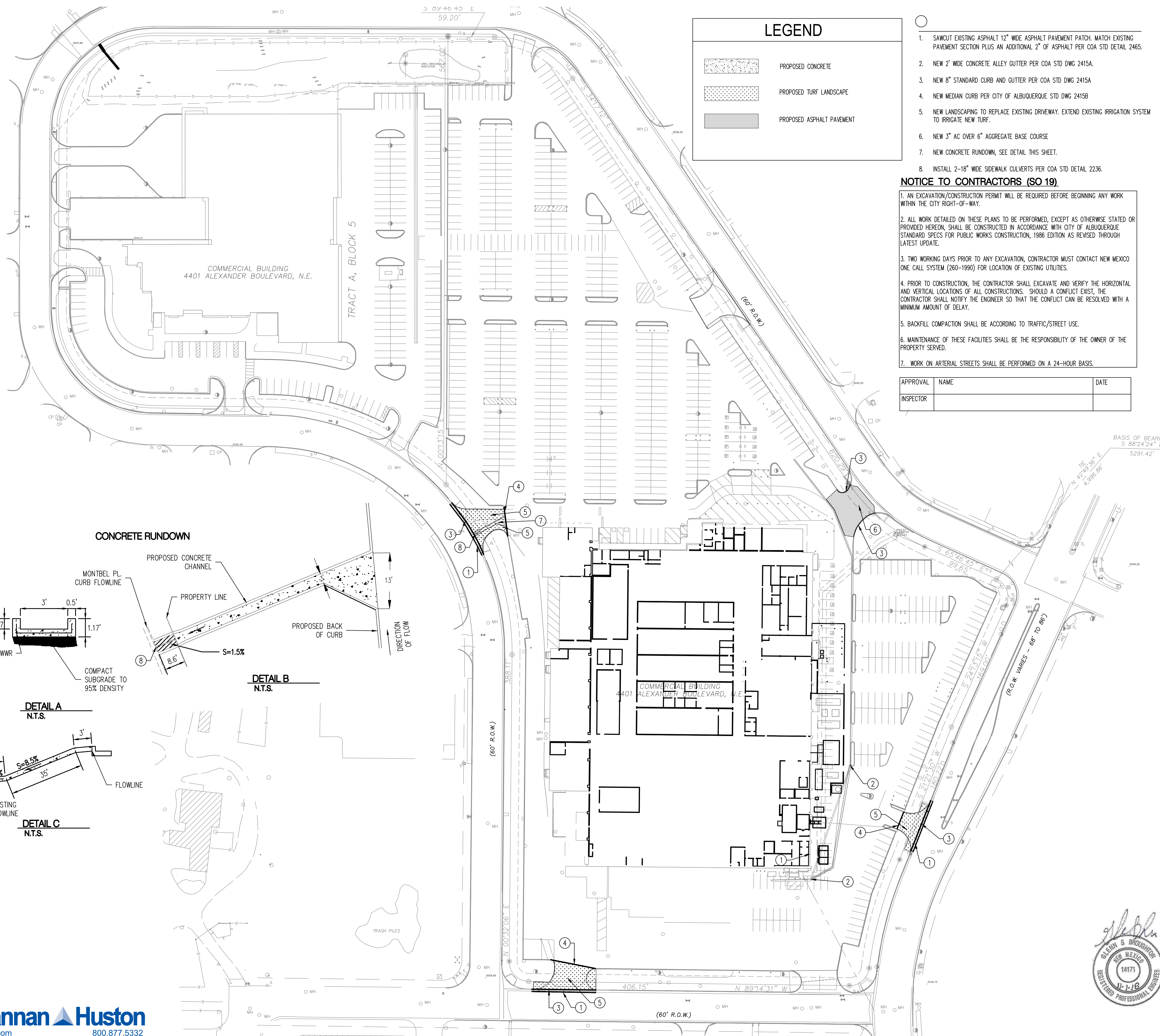


- KEYED NOTES
1. PROTECT EXISTING IMPROVEMENTS IN PLACE
  2. REMOVE EXISTING VALLEY GUTTER
  3. SAWCUT AT PROJECTED LIP OF GUTTER AND REMOVE ASPHALT PAVEMENT
  4. REMOVE EXISTING CURB TO CONTROL JOINT
  5. SAWCUT AND REMOVE EXISTING AC PAVEMENT
  6. SAWCUT AND REMOVE EXISTING CONCRETE RAMP
  7. REMOVE EXISTING CONCRETE WALL BARRIER
  8. REMOVE EXISTING SIDEWALK TO CONTROL JOINT

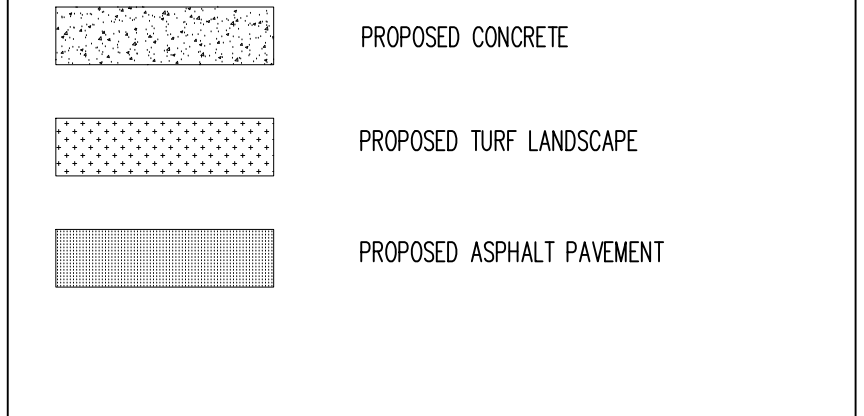


<b>OSO BIO SYRINGE LINE DEMOLITION PLAN</b>		
DRAWN BY:	DATE:	
CHECKED BY:	PROJECT NO. 20190058	SHEET NO. <b>C1.0</b>





**LEGEND**



1. SAWCUT EXISTING ASPHALT 12" WIDE ASPHALT PAVEMENT PATCH. MATCH EXISTING PAVEMENT SECTION PLUS AN ADDITIONAL 2" OF ASPHALT PER COA STD DETAIL 2465.
2. NEW 2' WIDE CONCRETE ALLEY GUTTER PER COA STD DWG 2415A.
3. NEW 8" STANDARD CURB AND GUTTER PER COA STD DWG 2415A.
4. NEW MEDIAN CURB PER CITY OF ALBUQUERQUE STD DWG 2415B.
5. NEW LANDSCAPING TO REPLACE EXISTING DRIVEWAY. EXTEND EXISTING IRRIGATION SYSTEM TO IRRIGATE NEW TURF.
6. NEW 3" AC OVER 6" AGGREGATE BASE COURSE.
7. NEW CONCRETE RUNDOWN, SEE DETAIL THIS SHEET.
8. INSTALL 2-18" WIDE SIDEWALK CULVERTS PER COA STD DETAIL 2236.

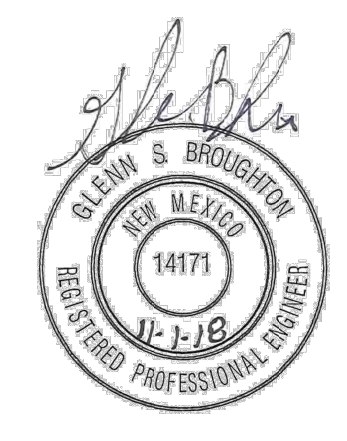
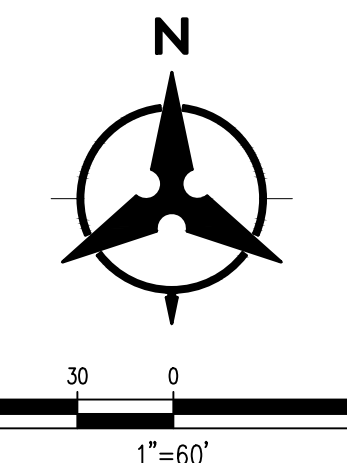
**NOTICE TO CONTRACTORS (SO 19)**

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2. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ALBUQUERQUE STANDARD SPECS FOR PUBLIC WORKS CONSTRUCTION, 1986 EDITION AS REVISED THROUGH LATEST UPDATE.
3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM (260-1990) FOR LOCATION OF EXISTING UTILITIES.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
5. BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
7. WORK ON ARTERIAL STREETS SHALL BE PERFORMED ON A 24-HOUR BASIS.

APPROVAL	NAME	DATE
INSPECTOR		

**GENERAL NOTES**

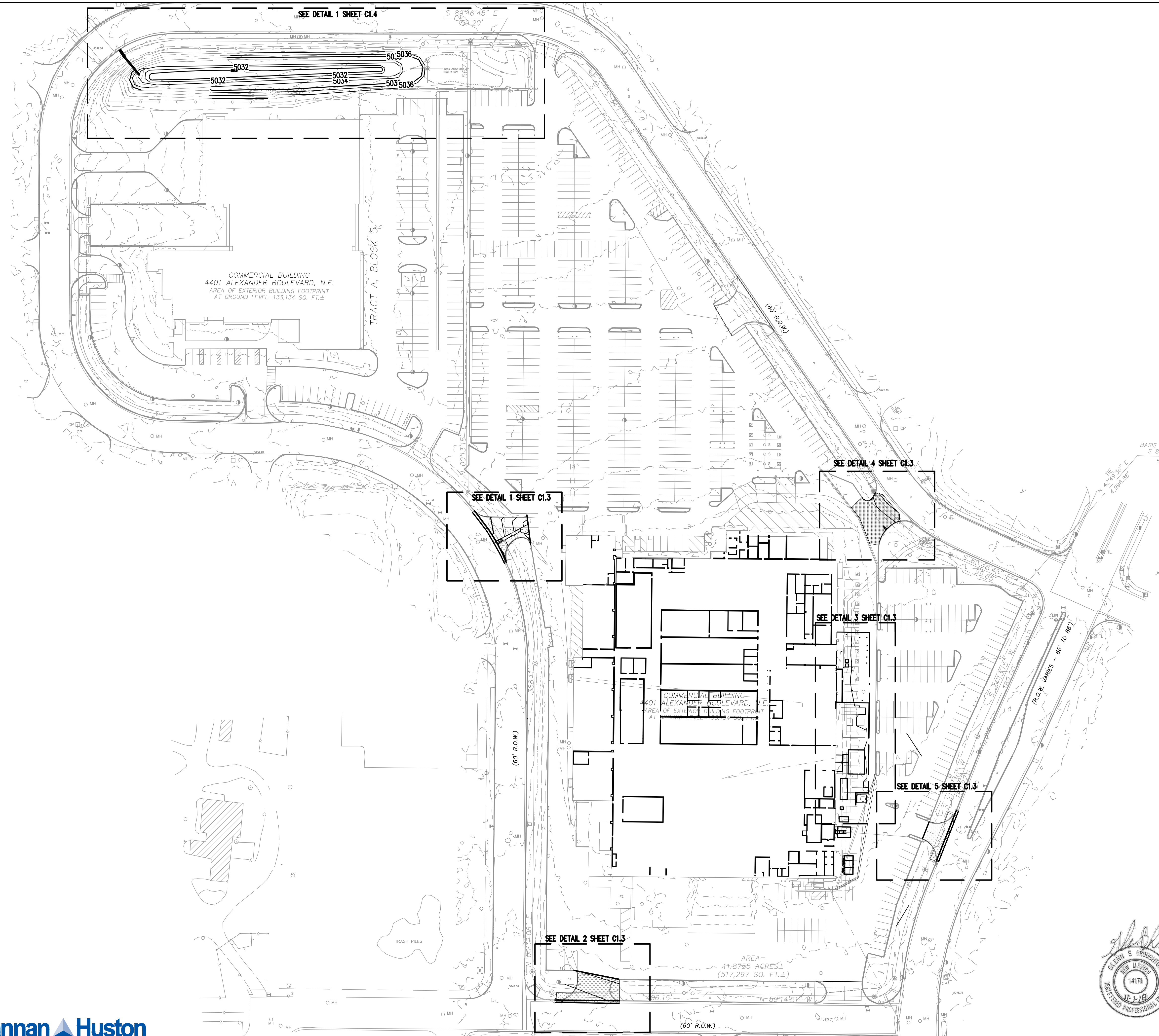
1. ALL WORK DETAILED ON THESE PLANS AND PERFORMED UNDER THIS CONTRACT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND THE PROJECT GEOTECHNICAL REPORT. WHERE APPLICABLE, NMAPWA PUBLIC WORKS STANDARDS SHALL APPLY.
2. AN EXCAVATION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY.
3. THE CONTRACTOR SHALL ABIDE BY ALL LOCAL, STATE, AND FEDERAL LAWS, RULES AND REGULATIONS WHICH APPLY TO THE CONSTRUCTION OF THESE IMPROVEMENTS, INCLUDING EPA REQUIREMENTS WITH RESPECT TO STORM WATER DISCHARGE.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL POTENTIAL OBSTRUCTIONS INCLUDING ALL UNDERGROUND UTILITIES. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION OBSERVER OR ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
5. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL CONTACT LINE LOCATING SERVICE FOR LOCATION OF EXISTING UTILITIES.
6. ALL ELECTRICAL, TELEPHONE, CABLE TV, GAS AND OTHER UTILITY LINES, CABLES, AND APPURTENANCES ENCOUNTERED DURING CONSTRUCTION THAT REQUIRE RELOCATION, SHALL BE COORDINATED WITH THAT UTILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL NECESSARY UTILITY ADJUSTMENTS. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR DELAYS OR INCONVENIENCES CAUSED BY UTILITY COMPANY WORK CREWS. THE CONTRACTOR MAY BE REQUIRED TO RESCHEDULE HIS ACTIVITIES TO ALLOW UTILITY CREWS TO PERFORM THEIR REQUIRED WORK.
7. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITY LINES WITHIN THE CONSTRUCTION AREA. ANY DAMAGE TO EXISTING FACILITIES CAUSED BY CONSTRUCTION ACTIVITY SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE AND APPROVED BY THE CONSTRUCTION OBSERVER.
8. CONSTRUCTION ACTIVITY SHALL BE LIMITED TO THE PROPERTY AND/OR PROJECT LIMITS. ANY DAMAGE TO ADJACENT PROPERTIES RESULTING FROM THE CONSTRUCTION PROCESS SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
9. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAYS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR MATERIAL WITHIN THE PUBLIC RIGHT-OF-WAY.
10. THE CONTRACTOR SHALL OBTAIN ALL THE NECESSARY PERMITS FOR THE PROJECT PRIOR TO COMMENCING CONSTRUCTION (I.E., BARRICADING, TOPSOIL DISTURBANCE, EXCAVATION PERMITS, EPA STORM WATER PERMITS, ETC.).
11. ALL PROPERTY CORNERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ALL PROPERTY CORNERS MUST BE RESET BY A REGISTERED LAND SURVEYOR.
12. THE CONTRACTOR SHALL PREPARE A CONSTRUCTION TRAFFIC CONTROL AND SIGNING PLAN AND OBTAIN APPROVAL OF SUCH PLAN FROM BERNALILLO COUNTY, TRAFFIC ENGINEERING DEPARTMENT, PRIOR TO BEGINNING ANY CONSTRUCTION WORK ON OR ADJACENT TO EXISTING STREETS.
13. ALL BARRICADES AND CONSTRUCTION SIGNING SHALL CONFORM TO APPLICABLE SECTIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), US DEPARTMENT OF TRANSPORTATION, LATEST EDITION.
14. THE CONTRACTOR SHALL MAINTAIN ALL CONSTRUCTION BARRICADES AND SIGNING AT ALL TIMES. THE CONTRACTOR SHALL VERIFY THE PROPER LOCATION OF ALL BARRICADING AT THE END AND BEGINNING OF EACH DAY.
15. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO CONFORM WITH EPA REQUIREMENTS, INCLUDING COMPLIANCE WITH NPDES PHASE 2 REQUIREMENTS.
16. EXCEPT AS PROVIDED HEREIN, GRADING SHALL BE PERFORMED AT THE ELEVATIONS AND IN ACCORDANCE WITH THE DETAILS SHOWN ON THIS PLAN.
17. THE COST FOR REQUIRED CONSTRUCTION DUST AND EROSION CONTROL MEASURES SHALL BE INCIDENTAL TO THE PROJECT COST.
18. ALL WORK RELATIVE TO FOUNDATION CONSTRUCTION, SITE PREPARATION, AND PAVEMENT INSTALLATION, AS SHOWN ON THIS PLAN, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "GEOTECHNICAL INVESTIGATION". ALL OTHER WORK SHALL, UNLESS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT, (FIRST PRIORITY) SPECIFICATIONS, AND/OR THE NMAPWA STANDARD SPECIFICATIONS FOR PUBLIC WORKS (SECOND PRIORITY).
19. EARTH SLOPES SHALL NOT EXCEED 3 HORIZONTAL TO 1 VERTICAL UNLESS SHOWN OTHERWISE.
20. IT IS THE INTENT OF THESE PLANS THAT THIS CONTRACTOR SHALL NOT PERFORM ANY WORK OUTSIDE OF THE PROPERTY BOUNDARIES EXCEPT AS REQUIRED BY THIS PLAN.
21. THE CONTRACTOR IS TO ENSURE THAT NO SOIL ERODES FROM THE SITE ONTO ADJACENT PROPERTY OR PUBLIC RIGHT-OF-WAY.
22. A DISPOSAL SITE FOR ANY & ALL EXCESS EXCAVATION MATERIAL, AND UNSUITABLE MATERIAL AND/OR A BORROW SITE CONTAINING ACCEPTABLE FILL MATERIAL SHALL BE OBTAINED BY THE CONTRACTOR IN COMPLIANCE WITH APPLICABLE ENVIRONMENTAL REGULATIONS AND APPROVED BY THE OBSERVER. ALL COSTS INCURRED IN OBTAINING A DISPOSAL OR BORROW SITE AND HAUL TO OR FROM SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE.
23. PAVING AND ROADWAY GRADES SHALL BE +/- 0.1' FROM PLAN ELEVATIONS. PAD ELEVATION SHALL BE +/- 0.05' FROM BUILDING PLAN ELEVATION.
24. ALL PROPOSED CONTOURS REFLECT TOP OF PAVEMENT ELEVATIONS IN THE PARKING AREA AND MUST BE ADJUSTED FOR MEDIANS AND ISLANDS.
25. VERIFY ALL ELEVATIONS SHOWN ON PLAN FROM BASIS OF ELEVATION CONTROL STATION PRIOR TO BEGINNING CONSTRUCTION.



**OSO BIO  
SYRINGE LINE  
PAVING PLAN**

DRAWN BY:	DATE:
CHECKED BY:	PROJECT NO. 20190058
	SHEET NO. <b>C1.1</b>



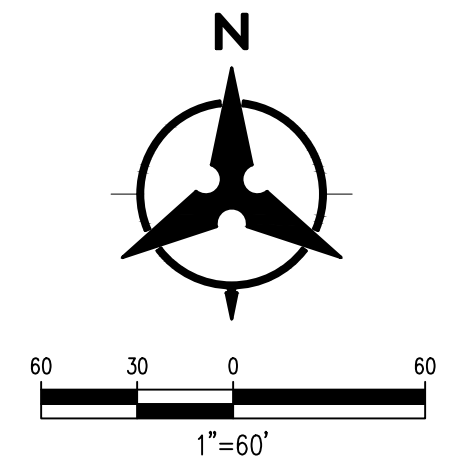


**Detention Pond Maintenance Plan**  
 Regular inspection of the detention pond and outlet should be conducted according to the schedule outlined below:

- Perform annual inspection of the detention pond and outlet pipe.
- Perform inspection of detention pond and outlet for precipitation events in excess of 1.5 inches. This precipitation depth is equivalent to roughly a 10 year storm event.

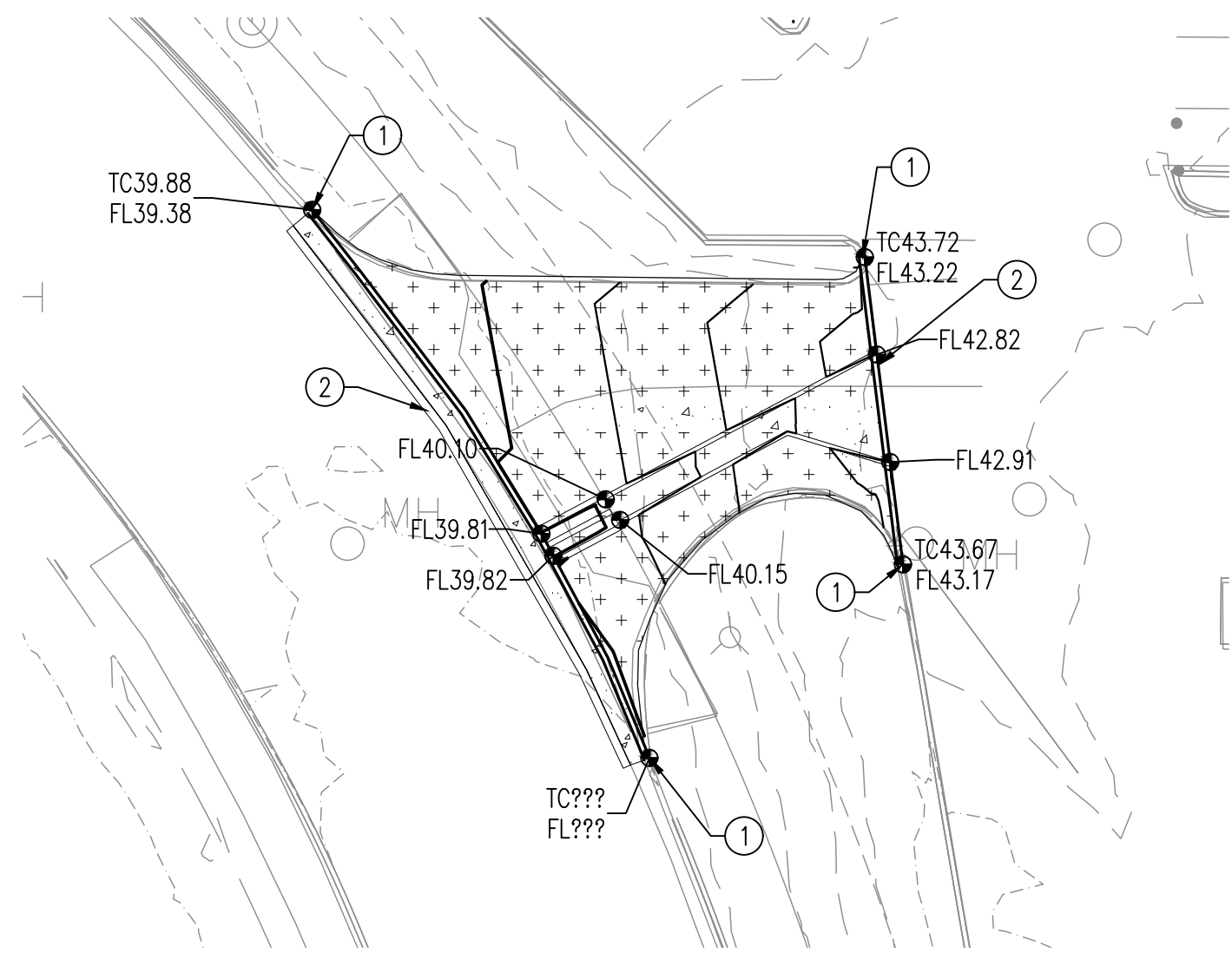
Maintenance shall include:

- Remove trash and debris from pond and outlet pipes.
- Remove accumulated sediment in excess of 6" above design elevation of the pond
- Remove vegetation and trees from within the detention pond and embankment
- Repair eroded or damaged areas of the detention pond and embankment

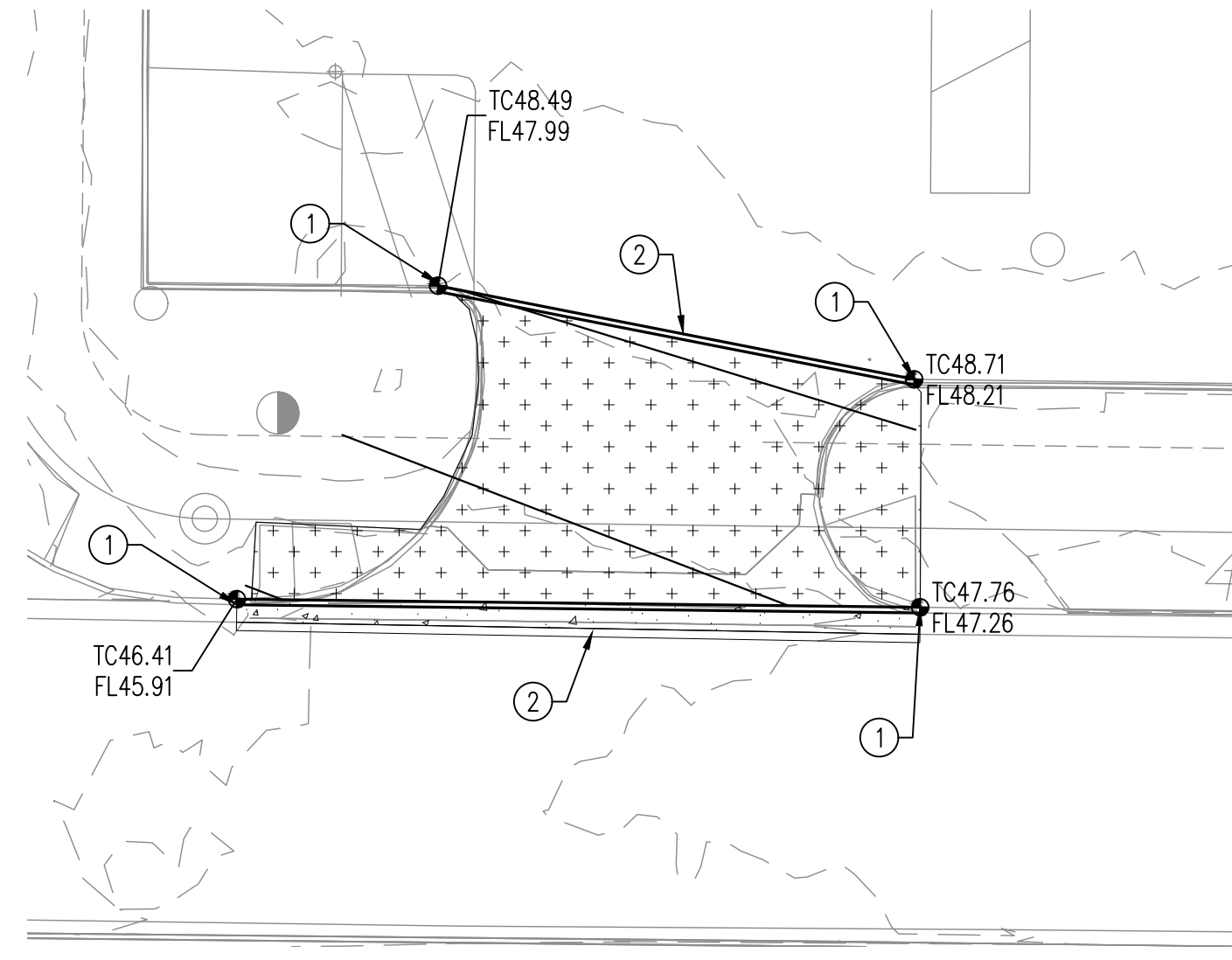


<b>OSO BIO SYRINGE LINE OVERALL GRADING PLAN</b>		
DRAWN BY:	DATE:	
CHECKED BY:	PROJECT NO. 20190058	SHEET NO. <b>C1.2</b>

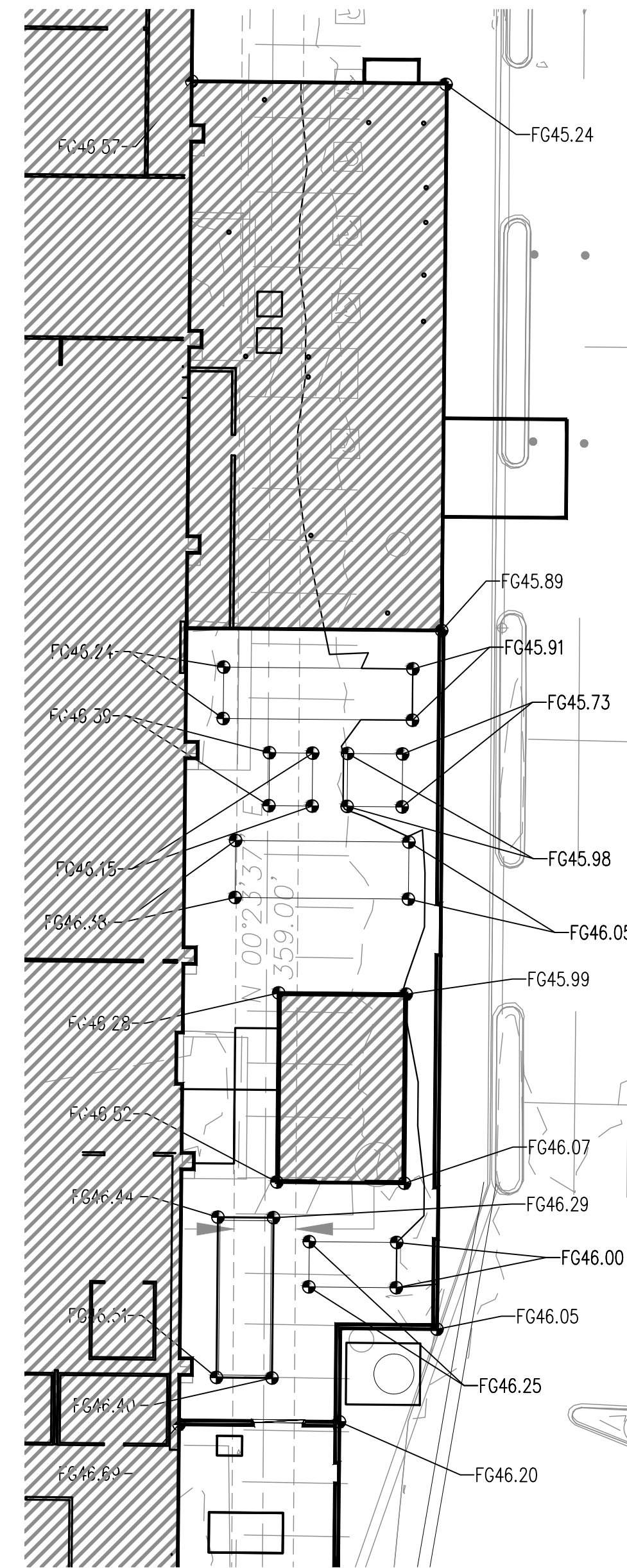




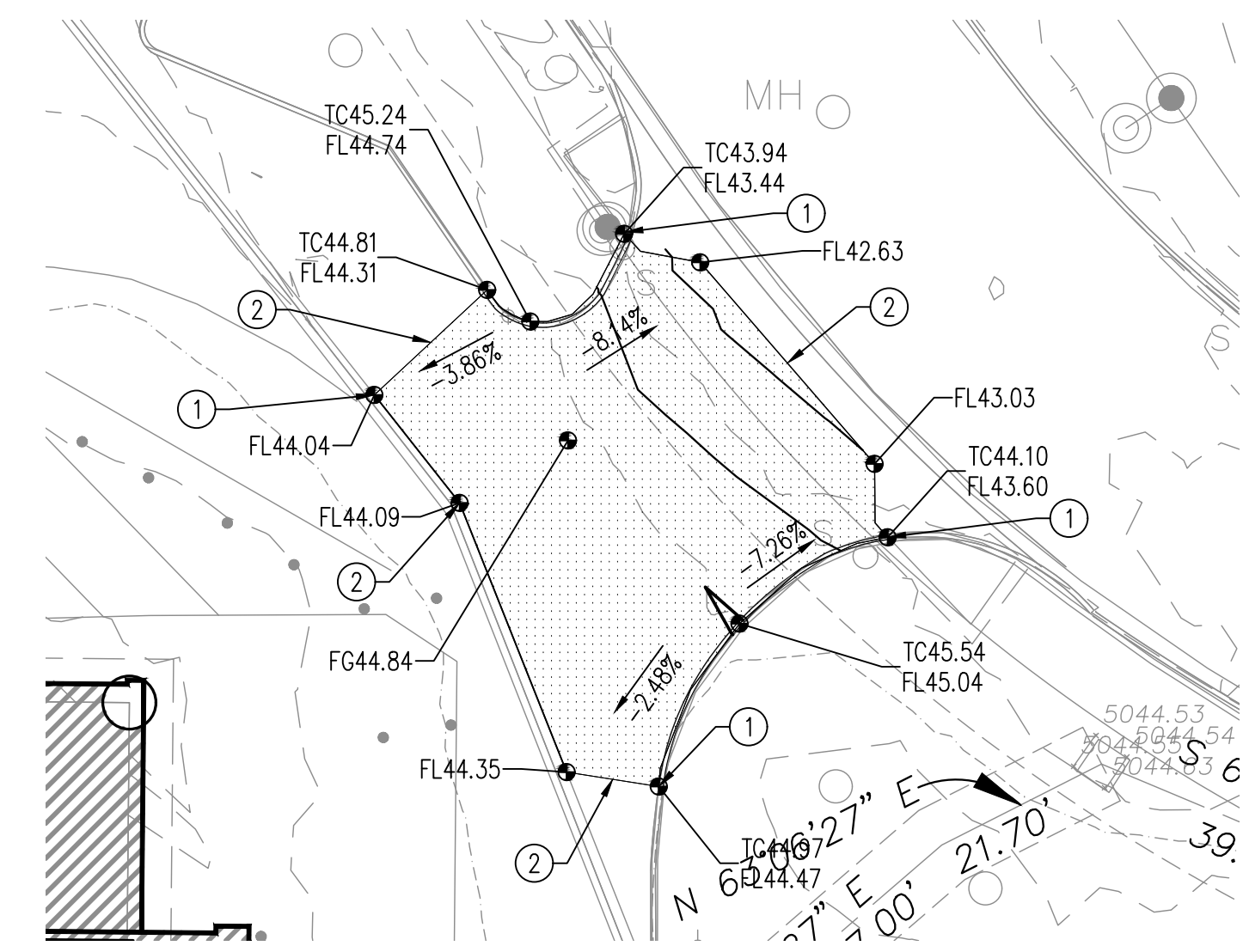
**DETAIL 1 - NW ENTRANCE**  
SCALE 1"=20'



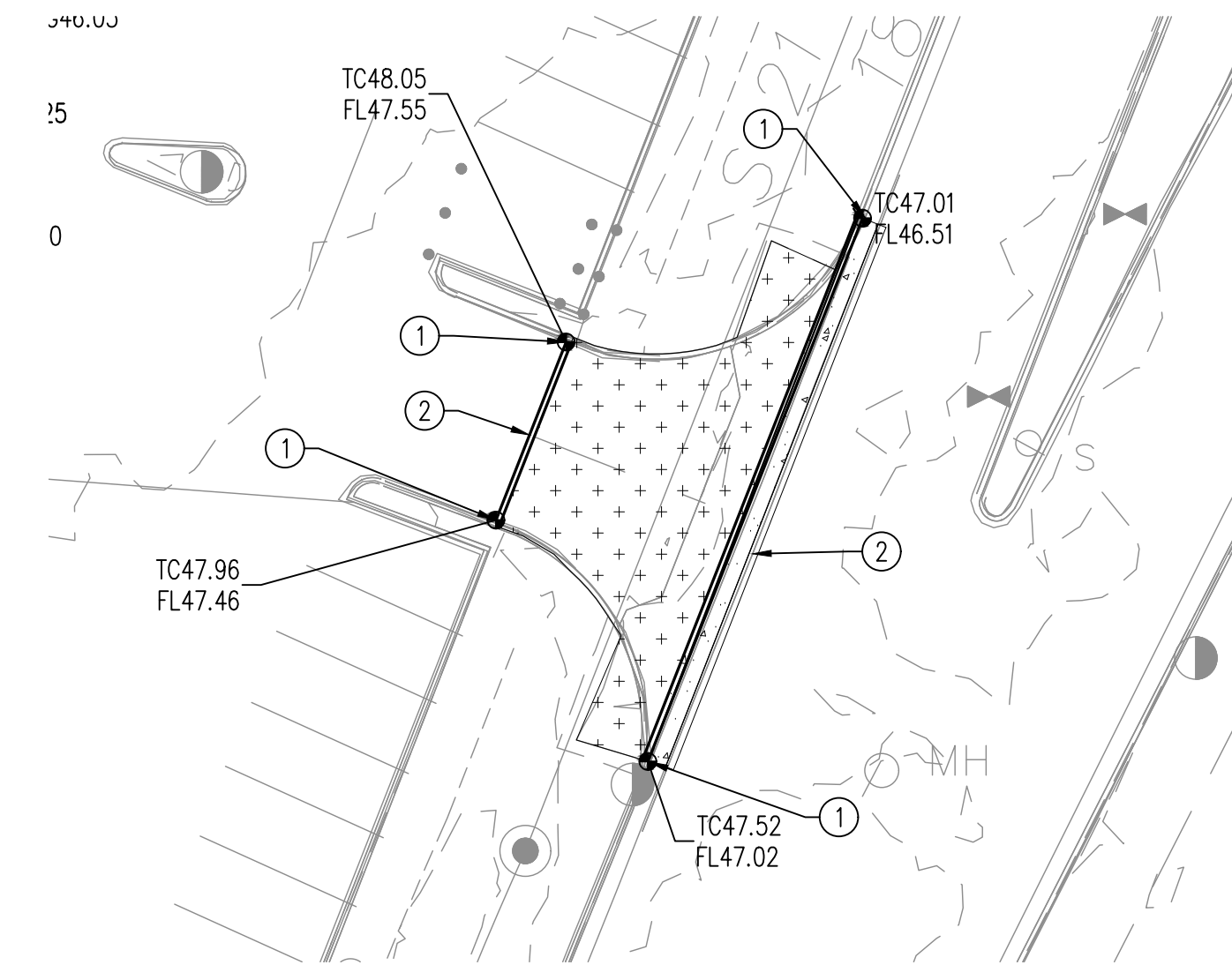
**DETAIL 2 - SW ENTRANCE**  
SCALE 1"=20'



**DETAIL 3 - BUILDING EXTENSION**  
SCALE 1"=20'



**DETAIL 4 - MIDDLE EAST ENTRANCE**  
SCALE 1"=20'



**DETAIL 5 - SE ENTRANCE**  
SCALE 1"=20'

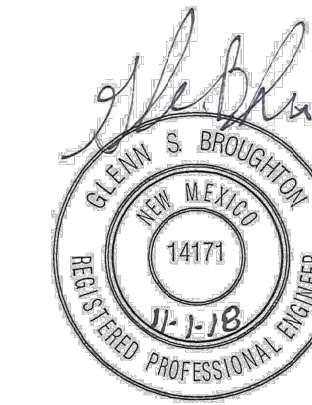
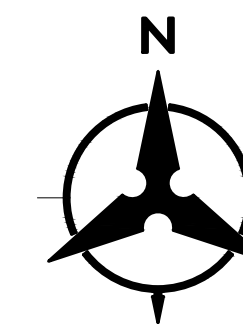
**KEYED NOTES**

1. MATCH EXISTING CURB HORIZONTALLY AND VERTICALLY.
2. MATCH EXISTING PAVEMENT GRADE.

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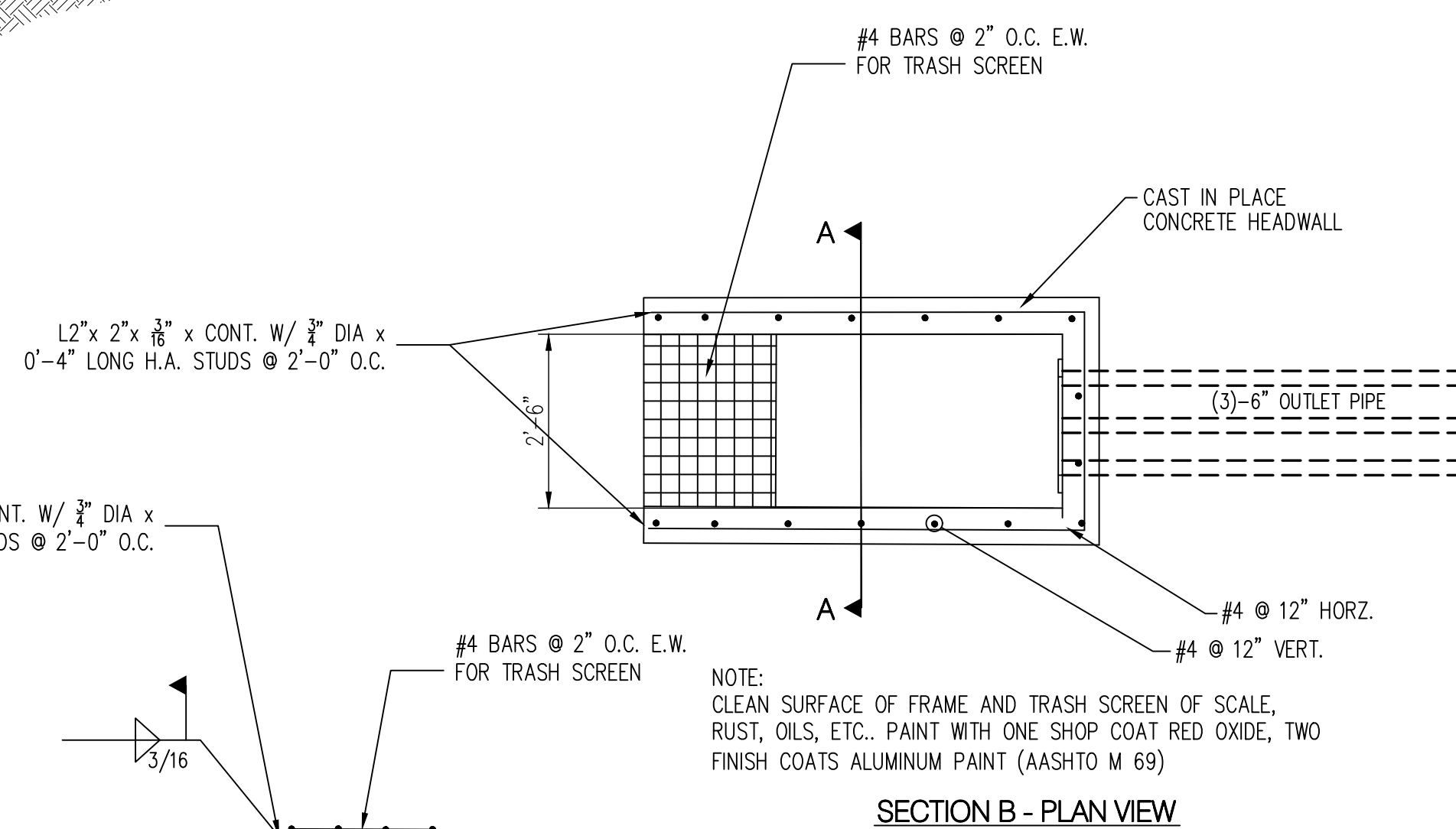
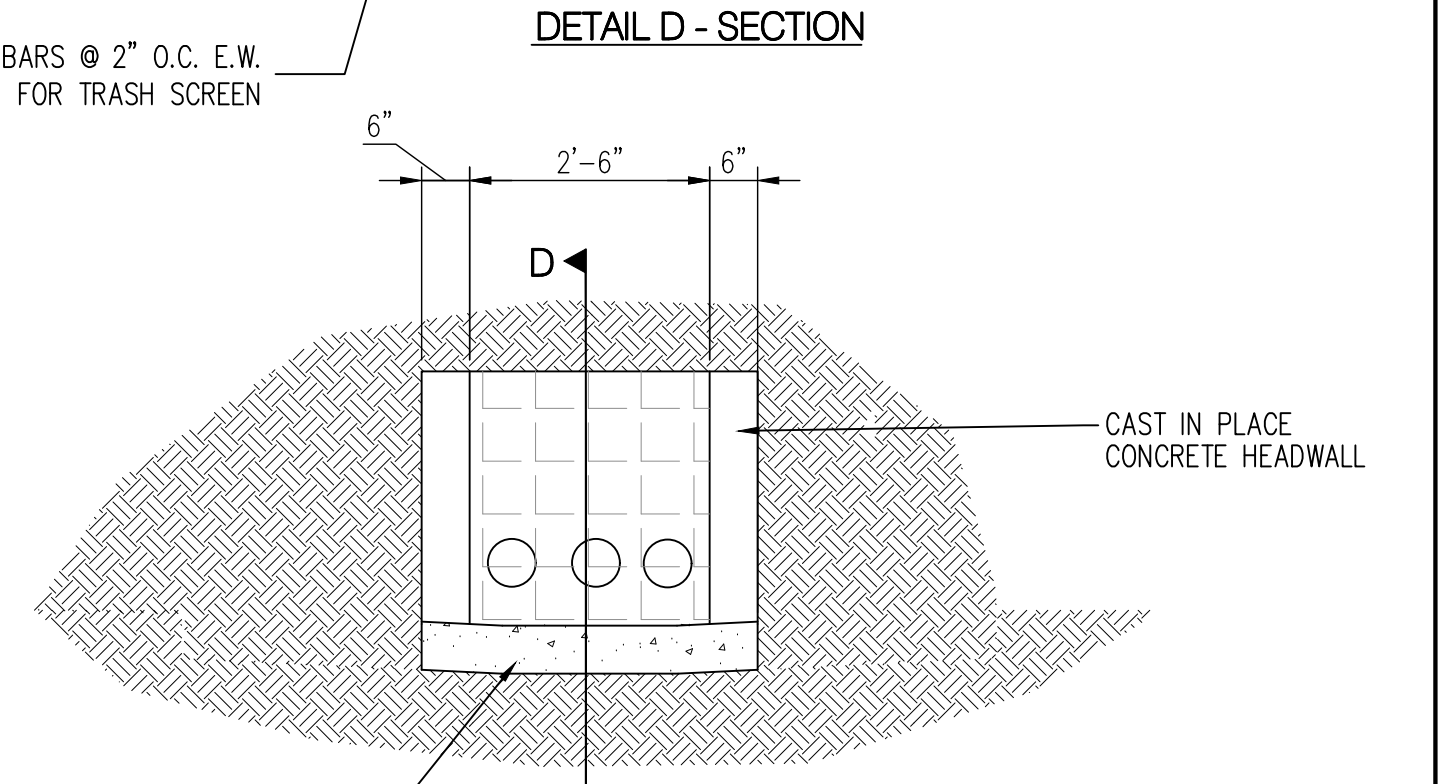
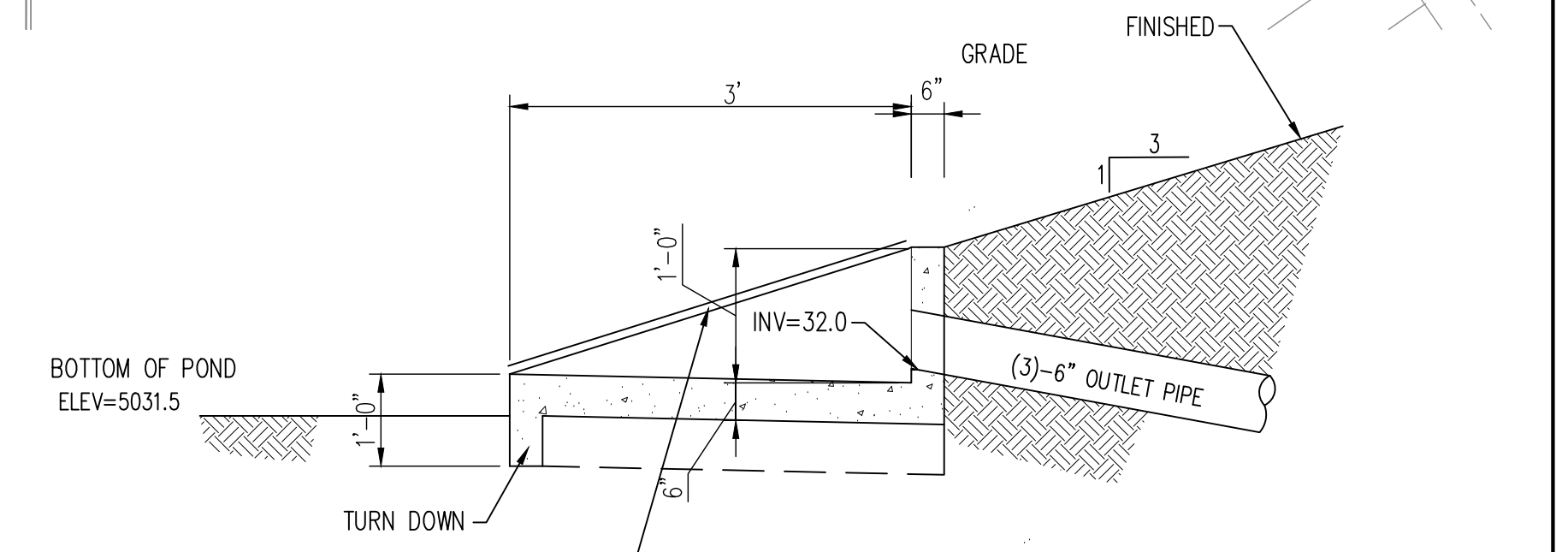
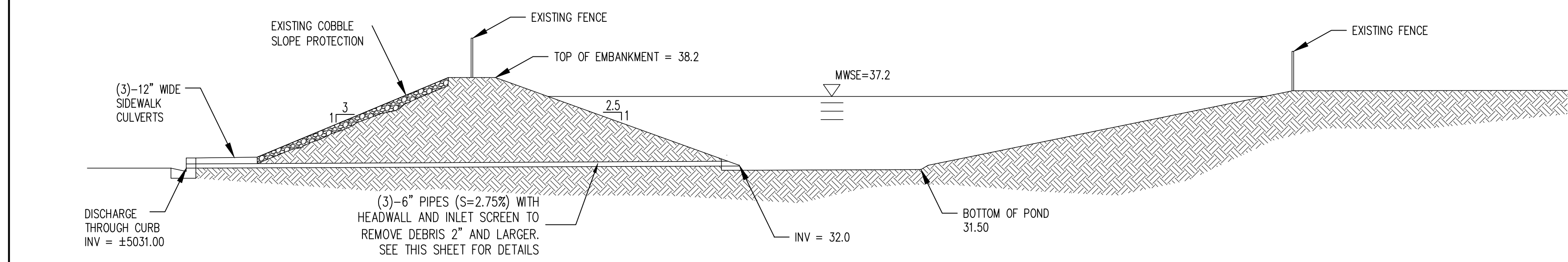
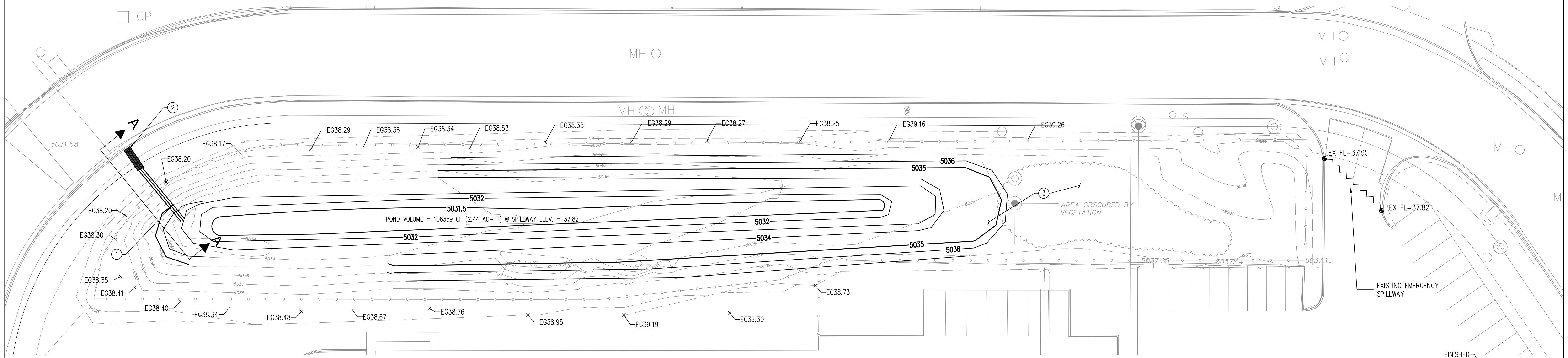
APPROVAL	NAME	DATE
INSPECTOR		



<b>OSO BIO SYRINGE LINE</b>		
<b>ENLARGED GRADING PLAN</b>		
DRAWN BY:	DATE:	
CHECKED BY:	PROJECT NO. 20190058	SHEET NO. <b>C1.3</b>



1. INSTALL (3)-6" PIPES WITH INLET SCREEN TO REMOVE DEBRIS 2" AND LARGER
2. INSTALL (3)-12" WIDE SIDEWALK CULVERTS PER COA STD DETAIL 2236. SIDEWALK CULVERT TO EXTEND 2' BEYOND BACK OF SIDEWALK
3. REMOVE ALL TREES AND SHRUBS WITHIN THE POND EMBANKMENT AND BOTTOM OF POND



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7. WORK ON ARTERIAL STREETS SHALL BE PERFORMED ON A 24-HOUR BASIS.

APPROVAL	NAME	DATE
INSPECTOR		



**OSO BIO  
SYRINGE LINE  
GRADING PLAN**

DRAWN BY:	DATE:
CHECKED BY:	PROJECT NO. 20190058
	SHEET NO. <b>C1.4</b>